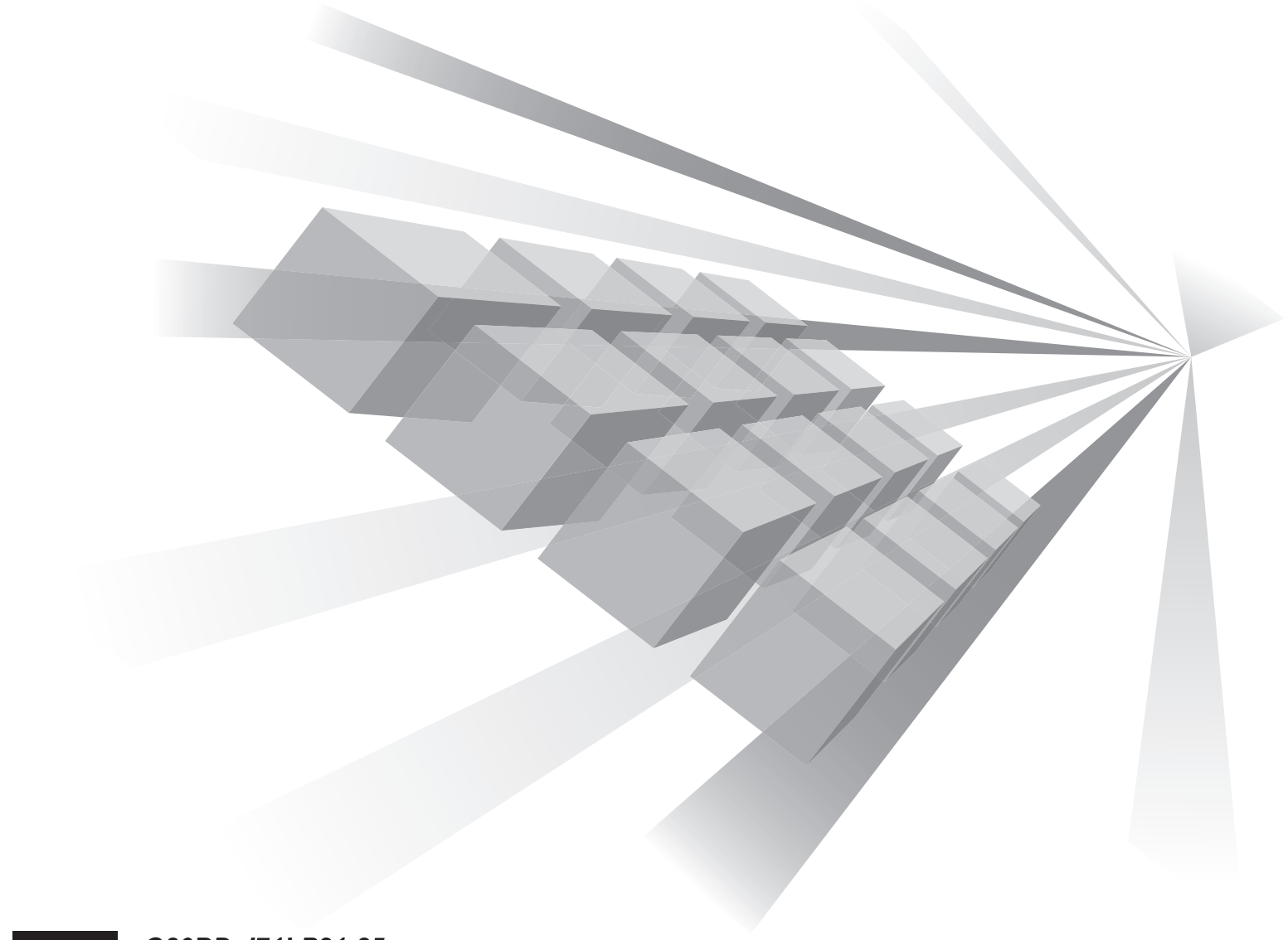
MITSUBISHI

Mitsubishi PC Interface Board

MELSEC

MELSECNET/H Interface Board User's Manual (For SW0DNC-MNETH-B)



MODEL

Q80BD-J71LP21-25
Q80BD-J71LP21S-25
Q81BD-J71LP21-25
Q80BD-J71LP21G
Q80BD-J71BR11

• SAFETY PRECAUTIONS •

(Be sure to read these instructions before using the product.)

Before using this product, read this manual and the relevant manuals introduced in this manual carefully and handle the product correctly with full attention to safety.
Note that these precautions apply only to this product. Refer to the user's manual of the CPU module for safety precautions on programmable controller systems.
In this manual, the safety instructions are ranked as "⚠ WARNING " and "⚠CAUTION".

⚠ WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Note that failure to observe the ⚠CAUTION level instructions may also lead to serious results depending on the circumstances.
Be sure to observe the instructions of both levels to ensure personal safety.
Please keep this manual in accessible place and be sure to forward it to the end user.

[Design Instructions]

⚠ WARNING

- Make sure to see this manual for information about each station's operating status when a communication error occurs in the network. Erroneous outputs and malfunctions may result in serious accidents.
- If a coaxial cable is disconnected, this may destabilize the line, and a data link communication error may occur in multiple stations. Make sure to create an interlock circuit in the sequence program so that the system will operate safely even if the above error occurs. Failure to do so may result in a serous accident due to faulty output or malfunctions.
- Provide a safety circuit outside the programmable controller so that the entire system will operate on the safety side even when an error occurs with the personal computer.
  There is a risk of an accident due to faulty output or malfunctioning.
  (1) Construct circuits outside the programmable controller, including an emergency stop circuit, protection circuit, interlock circuit for reciprocal operations such as forward and reverse, and interlock circuit for positioning high and low limits to prevent damage to the equipment.
  (2) If the station in which the board is installed is disconnected from the data link due to a data link error, the data output from that station and written in other stations will remain the same as immediately before the error occurred in the data link. This data will be retained until the data link for that station is reopened (returned to system).
  Provide a mechanism to monitor the status of data link and handle errors for each station that is connected to the data link system.

[Design Instructions]

⚠ CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other.
  They should be installed 100 mm (3.94 inch) or more from each other.
  Not doing so could result in noise that would cause malfunctioning.

[Installation Instructions]

⚠ CAUTION

- Use the board in an environment as described in the general specifications listed in this operating manual.
  If the board is used in an environment outside the ranges described in the general specifications, it may result in an electric shock, fire, malfunctioning, damage to or deterioration of the product.
- Be sure to shut off all phases of the external power supply used by the system before installing or removing the board. If all power is not turned off, this will result in failure of the board or malfunctioning.
- Install the board to a personal computer which is compliant with PCI standard or PCI Express® standard (Refer to "Section 2.5 Operating Environment"). Failure to do so may cause a failure or malfunction.
- Securely mount the board to the PCI slot of the mounting device.
  If the board is not mounted correctly, this may lead to malfunctioning, failure or cause the board to fall.
- Insert the communication cable securely into the board connector. After it has been inserted, check to make sure that it is not being lifted up.
  A faulty connection can lead to faulty input or output.
- When mounting the board, take care not to become injured by the components that are installed or surrounding materials.
- Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the board.
  Failure to do so may cause a failure or malfunctions of the board.
- When installing the board, take care not to contact with other boards.

[Wiring Instructions]

⚠ WARNING

- Be sure to shut off all phases of the external power supply used by the system before performing work such as installing the board and wiring.
  If all power is not turned off, there is a risk of electric shock or damage to the product.
- When turning on the power and operating the module after having installed the board and doing the wiring, always attach the cover for the device module in which the board is installed.
  There is a risk of electric shock if the module cover is not attached.

⚠ CAUTION

- Properly solder the parts of a soldering-type coaxial cable connector. Incomplete soldering may result in malfunction.
- Crimp the parts of a crimping-type coaxial cable connector with proper force at a proper position. Failure to do so may cause drop of the cable or malfunction.
- For the communication cable, specialized skills and tools are required to connect the plug and cable. The connector plug itself is a custom part.
  When purchasing, consult your local Mitsubishi representative.
  If the connection is incomplete, this can result in a short, fire or malfunction.
- Be sure to fix communication cables connecting to the board by placing them in the duct or clamping them.
  Cables not placed in the duct or without clamping may be hang freely and accidentally pulled, which may cause damage to the board or cable, or malfunction due to bad cable contacts.
- When removing the cable from the board, do not pull the cable.
  Pulling the cable that is still connected to the board may cause damage to the board or cable, or malfunction due to bad cable contacts.
- Prevent foreign matter such as chips or wiring debris from getting on the board.
  Failure to do so can result in fire, breakdowns or malfunction.
- Verify the rated voltage and pin assignment of the product and connect the external power supply cable properly.
  Connecting a power supply with a different voltage rating, imperfect cable crimping or faulty wiring may cause a fire or failure.
- Use a specified tool for crimping of the cable and contacting pin. Imperfect crimping may cause malfunction.
- Verify the pin assignment and fully insert the crimped contacting pin into the connector. Imperfect insertion may cause failure or malfunction.
- Insert the wired external power supply cable into the external power supply cable connector until a click is heard. Imperfect insertion may cause failure or malfunction.
- Keep the external power supply cable away from the main circuit cable, power cables and/or load cables connected to other than programmable controllers. Ensure a distance of 100mm (3.94 in.) between them. Failure to do so may result in malfunction due to noise, surge or induction.
- Always ground the personal computer. Failure to do so may cause malfunction.

[Startup/Maintenance Instructions]

⚠ WARNING

- Do not attach or remove the communication cable while the power supply is on.
  This may result in malfunctioning.
- Tighten the board fixing screws after turning off the power supply.
  There is a risk of electric shock if the screws are tightened while power is on.

⚠ CAUTION

- Thoroughly read the operating manual and carefully check to make sure everything is safe before performing operations such as making changes to the program while the module is operating, forced outputs, RUN, STOP and PAUSE.
  Operation errors will result in damage to the equipment or accidents.
- Do not dismantle or rebuild the board.
  This will result in breakdowns, malfunctioning, injury or fire.
- Be sure to shut off all phases of the external power supply used by the system before installing or removing the board.
  If all power is not turned off, this will result in failure of the board or malfunctioning.
- The board internal microprocessor reaches very high temperatures when it is running. Do not touch it directly when replacing the board.
  This will result in breakdowns, malfunctioning or injury.
- Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the board.
  Failure to do so may cause a failure or malfunctions of the board.

[Disposal Instructions]

⚠ CAUTION

- When disposing of this product, treat it as industrial waste.

• CONDITIONS OF USE FOR THE PRODUCT •

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

REVISIONS

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Print Date	∗ Manual Number	Revision
Nov., 2000	SH (NA)-080128-A	First printing
Mar., 2001	SH (NA)-080128-B	Model addition Q80BD-J71LP21G, Q80BD-J71LP21GE Correction Section 1.3, Appendix 3.1
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Dec., 2004	SH (NA)-080128-G	Chapter numbers of 5 to 14 were changed to 6 to 15 respectively. Correction Precautions for use, Generic Terms and Abbreviations, Chapter 1, Section 1.1, Section 1.2, Section 1.3, Section 2.1, Section 2.4, Section 2.5, Section 3.2, Chapter 7, Section 7.1, Section 7.2.4, Section 9.2.2, Section 9.2.3, Section 9.2.5, Section 9.2.10, Section 9.2.11, Section 10.1.2, Section 10.2, Section 13.2.1, Section 15.4.3 Addition Section 2.6, Chapter 5, Section 15.7
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PRECAUTIONS FOR USE

(1) Transfer function between loops and routing transfers

The MELSECNET/H board cannot be used as a relay station for the transfer function between data links and during routing transfers.

If the transfer function between data links and routing transfers are used, use the network module as a relay station.

(2) Remote I/O Network

The MELSECNET/H board cannot be used in a remote I/O net.

It can be used only in a PLC to PLC network.

(3) Restrictions for functions depending on the personal computer or the operating system

There are some restrictions for the functions or supported versions depending on the operating system or personal computer to be used.
For the operating system, refer to Section 2.5.

(4) Driver installation and updating

Do not install or update the driver other than the method written in the troubleshooting in this manual.

The consistency between the driver and utility cannot be identified, and CC-Link IE Controller Network board may not operate properly.

INTRODUCTION

Thank you for purchasing the Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE, Q80BD-J71BR11 MELSECNET/H Interface Board.
Before using this product, please read this manual and the relevant manuals carefully and develop familiarity with the functions and performance of the Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE, Q80BD-J71BR11 MELSECNET/H Interface Board to handle the product correctly.

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MANUALS

The following table lists the manuals relevant to this product.

You can order them as necessary.

Relevant Manuals

Manual Name	Manual Number (Model Code)
Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network) This manual explains the system configuration, performance specification, function, handling, wiring and troubleshooting for MELSECNET/H network system. (Option)	SH-080049 (13JF92)
For QnA/A4AR MELSECNET/10 Network System Reference Manual This manual explains the system configuration, performance specification, function, handling, wiring and troubleshooting for MELSECNET/10 network system. (Option)	IB-66690 (13JF78)
MELSEC Data Link Library Reference Manual This manual explains the programming, function specifications, and sample programming of the MELSEC data link library. (Option)	SH-081035ENG (13JV25)

REMARK

MELSEC Data Link Library Reference Manual is stored on the CD-ROM of software package with PDF file.
Manuals in printed form are sold separately for single purchase. Order a manual by quoting the manual number (model code) listed in the table above.

HOW TO USE THIS MANUAL

"How to Use This Manual" differs depending on the purpose for which the MELSECNET/H board is used. Use this manual with reference to the following contents.

(1) When desiring an overview or to know the features of the MELSECNET/H board (Chapter 1)

Chapter 1 gives an overview of the MELSECNET/H board and its features.

(2) When desiring to know about the system configuration (Chapter 2)

Chapter 2 gives the system configuration.

(3) When desiring to know the specifications of the MELSECNET/H board (Chapter 3)

Chapter 3 gives the specifications of the MELSECNET/H board.

(4) When desiring to know the functions of the MELSECNET/H board (Chapter 4)

Chapter 4 gives the functions of the MELSECNET/H board.

(5) When desiring to know the procedure up to the point of operation of the MELSECNET/H board and settings (Chapter 6)

Chapter 6 gives the procedures up to the point of operation and the settings.

(6) When desiring to know the parameter settings for the MELSECNET/H board (Chapter 7)

Chapter 7 gives the parameter settings.

(7) When desiring to know the procedure for installing and uninstalling the software package (Chapter 8)

Chapter 8 gives the procedure for installing and uninstalling the software package.

(8) When desiring to know the operation of each utility (Chapter 9)

Chapter 9 gives the operation methods for each utility.

(9) When desiring to know about the MELSEC data link library (Chapter 10)

Chapter 10 gives overview concerning the MELSEC data link library.

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(10) When desiring to know the interlock related signals (Chapter 11)

Chapter 11 gives the interlock related signals.

(11) When desiring to know the application functions (Chapter 12)

Chapter 12 gives the MELSECNET/H board's application functions.

(12) When desiring to know about troubleshooting (Chapter 14)

Chapter 14 gives information on troubleshooting.

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GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, this manual uses the following generic terms and abbreviations to describe MELSECNET/H interface board.

Generic Term/Abbreviation	Description
Q80BD-J71LP21-25	Abbreviation for Q80BD-J71LP21-25 MELSECNET/H interface board.
Q80BD-J71LP21S-25	Abbreviation for Q80BD-J71LP21S-25 MELSECNET/H interface board.
Q80BD-J71LP21G	Abbreviation for Q80BD-J71LP21G MELSECNET/H interface board.
Q80BD-J71LP21GE	Abbreviation for Q80BD-J71LP21GE MELSECNET/H interface board.
Q80BD-J71BR11	Abbreviation for Q80BD-J71BR11 MELSECNET/H interface board.
Q81BD-J71LP21-25	Abbreviation for Q81BD-J71LP21-25 MELSECNET/H interface board.
MELSECNET/H board	Generic term for Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE, and Q80BD-J71BR11.
SW0DNC-MNETH-B	Product name of the software package for MELSECNET/H interface board.
MNETH utility	Abbreviation for MELSECNET/H utility
GX Developer	General product name for product model names SW8D5C-GPPW-E, SW8D5C-GPPW-EA, SW8D5C-GPPW-EV, and SW8D5C-GPPW-EVA.
MX Links	General product name for product model names SWnD5F-CSKP-E (n denotes the version number)
MX Component	General product name for product model names SWnD5C-ACT-E, SWnD5C-ACT-EA (n denotes the version number)
MELSECNET/10	Abbreviation for A70BDE-J71QLP23/A70BDE-J71QLP23G E/A70BDE-J71QBR13/A70BDE-J71QLR23 MELSECNET/10 interface board.
ACPU	Generic term for the CPU of MELSEC-A series.
QnACPU	Generic term for the CPU of MELSEC-QnA series.
QCPU	Generic term for the CPU of MELSEC-Q series.
QJ71LP21	Abbreviation for QJ71LP21, QJ71LP21G, Q71LP21GE, QJ71LP21-25, QJ71LP21S-25, MELSECNET/H network module. However, if shown for a particular model, QJ71LP21, QJ71LP21G, Q71LP21GE, QJ71LP21-25, QJ71LP21S-25 is entered.
QJ71BR11	Abbreviation for QJ71BR11 MELSECNET/H network module.
Network module	Generic term for QJ71LP21, QJ71BR11
MELSECNET/H	Abbreviation for Q corresponding MELSECNET/H network system.
MELSECNET/10	AnU corresponding, QnA/Q4AR corresponding MELSECNET/10 network system.
MELSECNET/H (10 Mbps)	Abbreviation in case of using MELSECNET/H board with communication rate of 10 Mbps.
MELSECNET/H (25 Mbps)	Abbreviation in case of using MELSECNET/H board with communication rate of 25 Mbps.
MELSECNET/H mode	Abbreviation in case of using MELSECNET/H board and network module with MELSECNET/H.
MELSECNET/H Extended mode	Abbreviation for the extended MELSECNET/H mode, which is extended in the maximum number of link points per station.
MELSECNET/10 mode	Abbreviation in case of using MELSECNET/H board and network module with MELSECNET/10.
Board WDT	Abbreviation for the watchdog timer that monitors the operation of network board
Driver WDT	Abbreviation for the watchdog timer that monitors the communication status between a network board and a personal computer, or operating status of a personal computer

MEANING AND CONTENTS OF THE TERMS

This section describes meaning and contents of the terms in this manual.

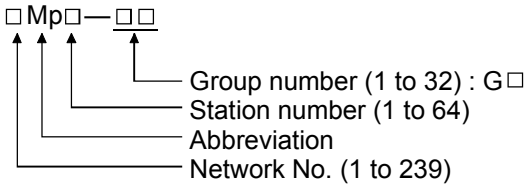
(1) Abbreviations for control station and normal station, and symbol format

This section explains abbreviations for control station and normal station, and symbol format to be used in this manual.

(a) Abbreviation

Abbreviation	Name
MP	Control station
NS	Normal station (Station that can serve as a control station)

(b) Symbol format



[Example]

1) Network No. 3, control station, station number 6: 3MP6
2) Network No. 5, normal station, station number 3: 5NS3

PACKING LIST

The packing list of the MELSECNET/H board is given below.

Item	Quantity
Board	1
Connector set for external power supply cable(Q80BD-J71LP21S-25 only)	1
F-type connector (A6RCON-F) (Q80BD-J71BR11 only)	1
"Before Using the Product"	1
Software Package (CD-ROM) *1	1
Software license agreement	1

*1: Manuals are stored on the CD-ROM in PDF format.

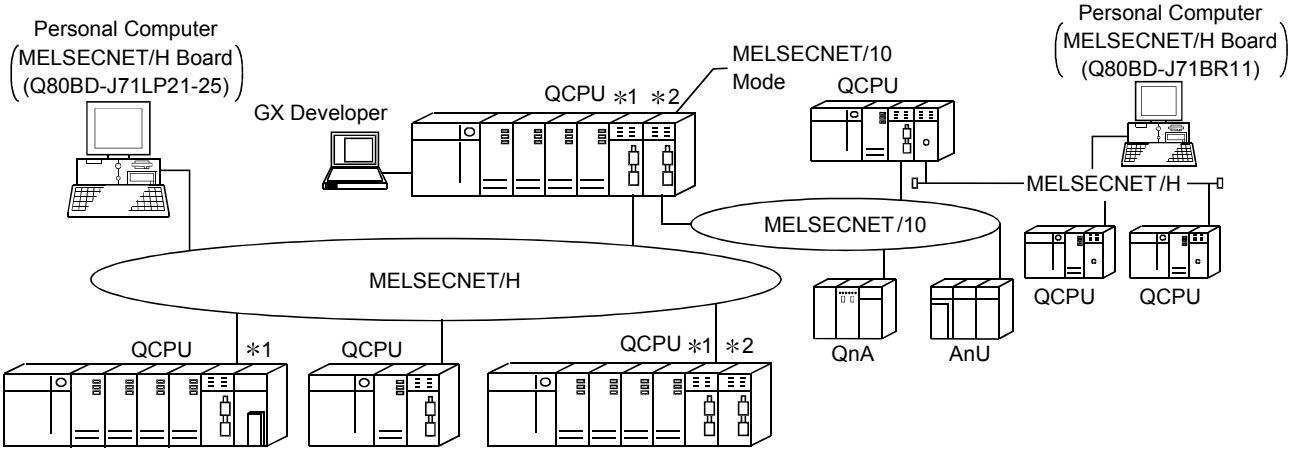
1 OVERVIEW

This is a manual you read when using the MELSCNET/H board in the MELSECNET/H mode or MELSECNET/H Extended mode. When using the MELSCNET/H board in the MELSCNET/H network, refer to "Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)". Also, when using the board in the MELSECNET/10 network system, refer to "For QnA/Q4AR Corresponding MELSECNET/10 network system reference manual".

1.1 Overview

The MELSECNET/H is a network system which is used to connect multiple sequencer modules and personal computers, and is equipped with functions and performance realized in the MELSECNET/10 for general control of a production line.
In the MELSECNET/H, there is a network system which includes an optical loop system (communication rates: 10 Mbps, 25 Mbps) and a coaxial bus system (communications rate: 10 Mbps), enabling large volume communications at high speeds.
Also, in order to improve the performance of the MELSECNET/10 network and achieve upward compatibility, MELSECNET/H supports the MELSECNET/ H and MELSECNET/H Extended modes (high performance, high speed mode) and the MELSECNET/10 Mode (function compatible and performance compatible mode).

Mode	Description
MELSECNET/H mode	Set this mode when all CPUs within the network are QCPUs.
MELSECNET/H Extended mode	The maximum number of link points per station has been increased compared with the MELSECNET/H mode. In excess of 2000 bytes, a maximum of 35840 bytes can be set. Set this mode when the system uses many link points per station.
MELSECNET/10 mode	This mode is used to operate the MELSECNET/H board on a MELSECNET/10 network.



∗1: The multiple CPU system compatible network module is for function version B and subsequent products.
∗2: In the multiple CPU system, a network module that becomes a relay station is the same as the control CPU.

1

POINT
(1) For MELSECNET/H, select Q compatible network modules. (2) If QnACPU or ACPU are included in the same network, select MELSECNET/10 mode which is compatible with MELSECNET/10. (3) All of network modules and MELSECNET/H boards within the same network must be set to the same mode (network type) *1. *1: MELSECNET/H mode, MELSECNET/H Extended mode and MELSECNET/10 mode are available.

1.2 Features

The features of the MELSECNET/H board are as shown below.

(1) A personal computer can be incorporated into MELSECNET/H.

By mounting the MELSECNET/H board in a personal computer, the personal computer can be used as a MELSECNET/H or MELSECNET/10 control station or normal station.

Board model name	Mode	Supported network
Q80BD-J71LP21-25 Q81BD-J71LP21-25 Q80BD-J71LP21S-25	MELSECNET/H Mode, MELSECNET/H Extended Mode	MELSECNET/H (10 Mbps / 25 Mbps) Optical Loop System
	MELSECNET/10 Mode	MELSECNET/10 Optical Loop System
Q80BD-J71BR11	MELSECNET/H Mode, MELSECNET/H Extended Mode	MELSECNET/H (10 Mbps) Coaxial Bus System
	MELSECNET/10 Mode	MELSECNET/10 Coaxial Bus System
Q80BD-J71LP21G Q80BD-J71LP21GE	MELSECNET/H Mode, MELSECNET/H Extended Mode	MELSECNET/H (10 Mbps) Optical Loop System
	MELSECNET/10 Mode	MELSECNET/10 Optical Loop System

(2) By adopting the PCI/PCI Express® standard, complicated switch settings are no longer required.

The system can be used simply by installing the MELSECNET/H board in the personal computer, then installing the software.
The channel No., station No. and other settings can be carried out easily in the MNETH Utility.

(3) Compatibility with the previous MELSECNET/10 board's operations is maintained.

(a) Upward compatibility of user programs

Since MELSECNET/H board has the same number of the maximum mountable board and channel number as the previous MELSECNET/10 board, the exiting user programs can be utilized.

(b) Compatible with the GX Developer, MX Links and MX Component.

It is possible to access the programmable controller CPU using the GX Developer, MX Links and MX Component from a personal computer where the MELSECNET/H board is installed.

(4) Compatible with multiple CPU systems.

By using station designations of logical station No. on the MNETH utility, MELSECNET/H board is capable of communicating with a multiple CPU system.

(5) Compatible with redundant CPU systems.

Only by specifying whether the destination is a control or standby station using the user program, access is simply made without considering the current operating system state of the redundant CPU system.

(6) Compatible with MELSECNET/H Extended mode

The MELSECNET/H Extended mode is the extended MELECNET/H mode, which is extended in the maximum number of link points per station. With this mode, the maximum number of link points per station can be set to 2000 bytes or more, i.e., up to 35840 bytes.
This mode is suitable for the system that needs many number of link points per station.

(7) Drivers are provided for compatibility with each OS.

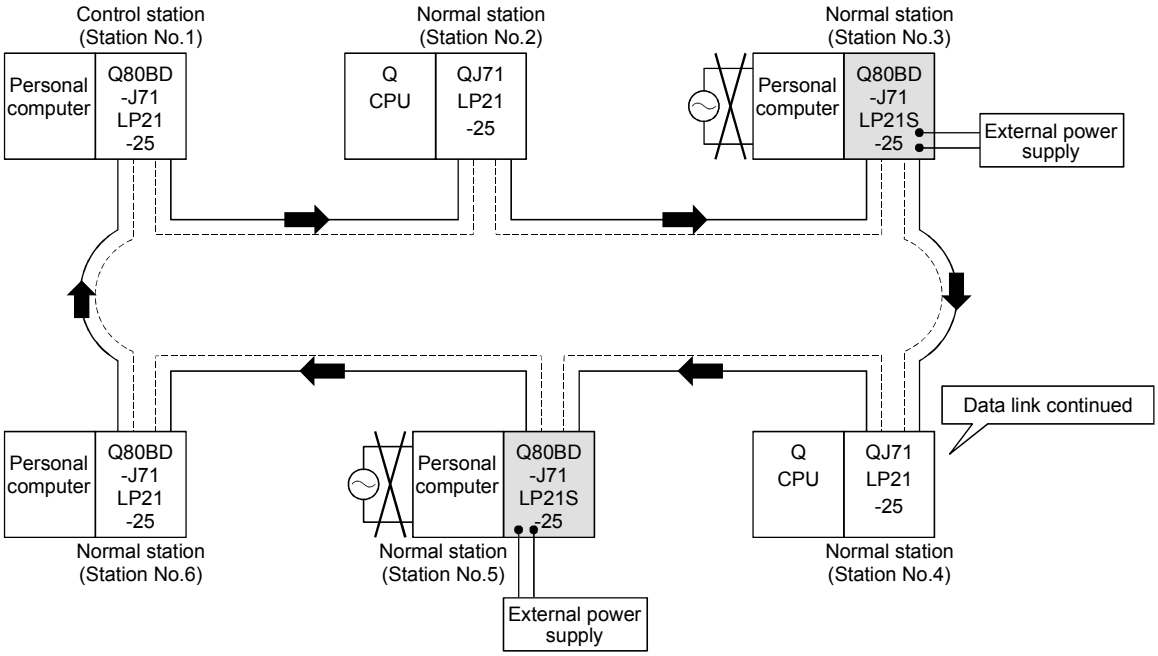
Each type of driver is provided, so it is easy to build a system that is compatible with the user environment.
For details on the compatible operating system, refer to Section 2.5.

(8) User programming functions are provided.

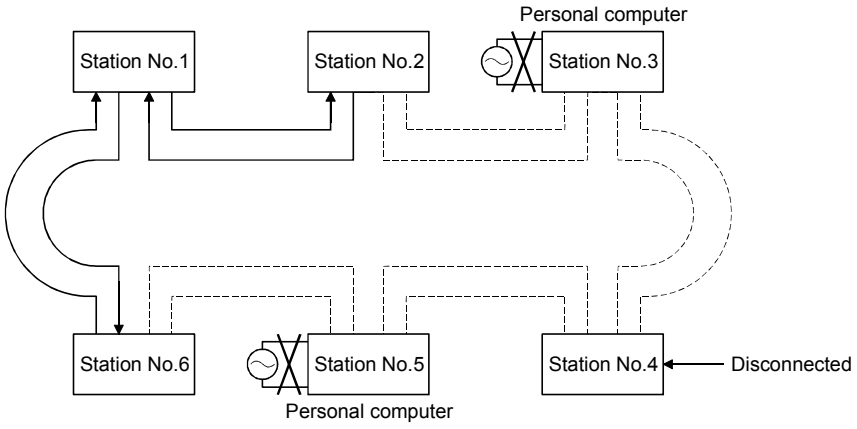
Through Microsoft® Visual Basic® and Microsoft® Visual C++® compatible functions, it is possible to carry out remote control of a programmable controller CPU or read and write to devices, and user programs can be created easily.

(9) External power supply allows continuous network communication even during power-off of personal computer. (Function of the Q80BD-J71LP21S-25)

Since power is supplied externally, the Q80BD-J71LP21S-25 can continue network communication (baton passing) even if a personal computer is powered off and data link cannot be performed.
Therefore, a normally operating station connected between other stations with power-off computers will not be disconnected from the data link.
Another advantage is that the link scan time is stabilized since loopback can be also prevented.



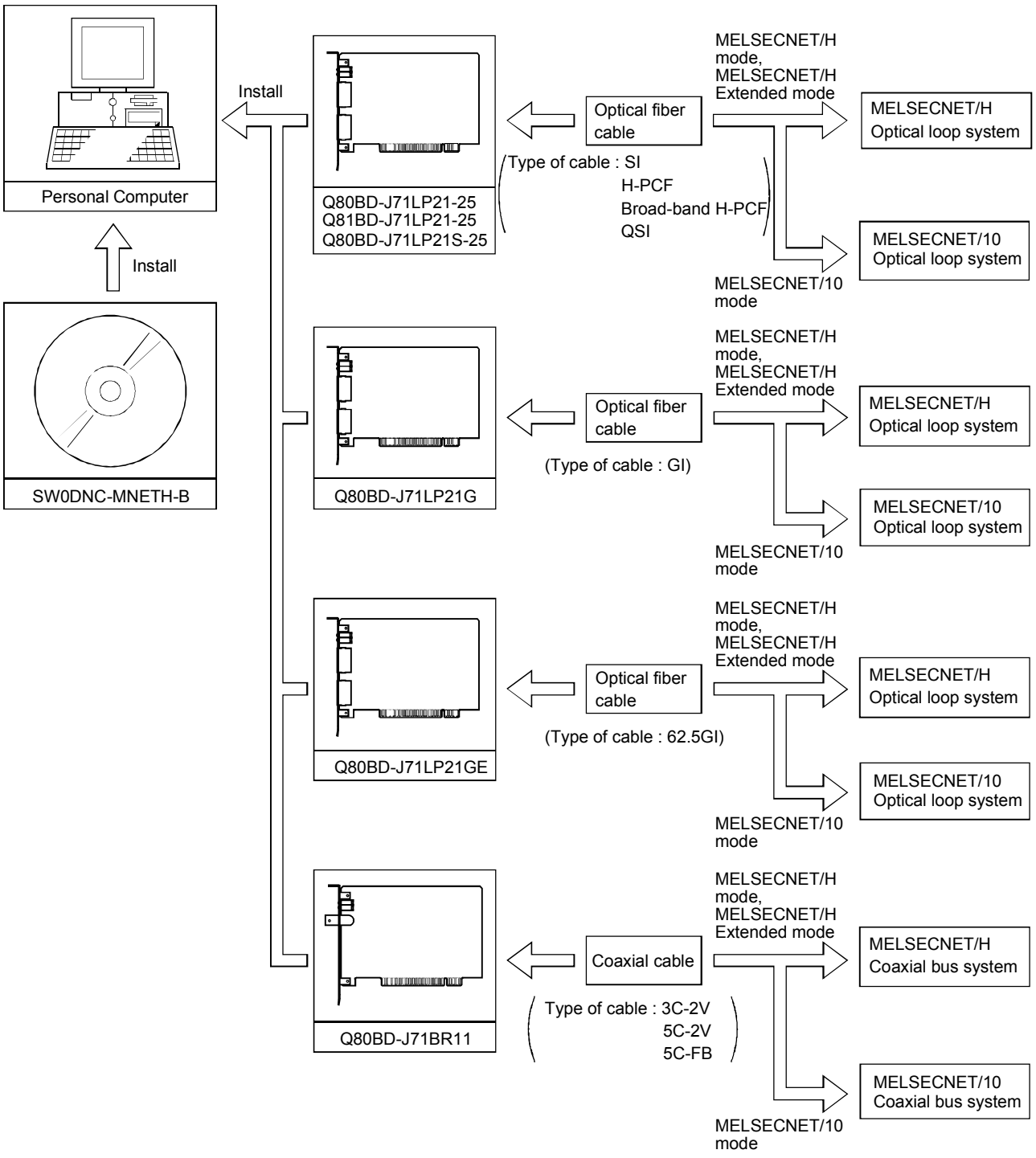
When station No. 3 and No.5 use MELSECNET/H boards without the external power supply function and if their personal computers are powered off, station No.4 is cut off from the network as well as No.3 and No.5.



2 SYSTEM CONFIGURATION

2.1 MELSECNET/H Board System Configuration

The system configuration when the MELSECNET/H board is mounted to a personal computer is shown below.



POINT

(1) When using the MELSECNET/H Extended mode
  (a) Use the MELSECNET/H board of ROM version 2X or later and SW0DNC-MNETH-B version 11M or later.
  (b) When assigning 2000 bytes or more to the number of link points sent by a station, set all stations including control stations and normal stations to the MELSECNET/H Extended mode.

(2) When using the Q80BD-J71LP21S-25
  Use the SW0DNC-MNETH-B version 12N or later.

(3) When using the Q80BD-J71LP21-25, Q81BD-J71LP21-25 or Q80BD-J71LP21S-25 at a communication speed of 25Mbps, errors may occur at all stations if multiple boards with the same network number are installed, or the operating systems are started up/shut down or the boards are reset simultaneously on the adjacent personal computers. In this case, set the communication speed to 10Mbps.

(4) If the QnACPU or ACPU are included in the same network, select MELSECNET/10 mode which is compatible with MELSECNET/10.

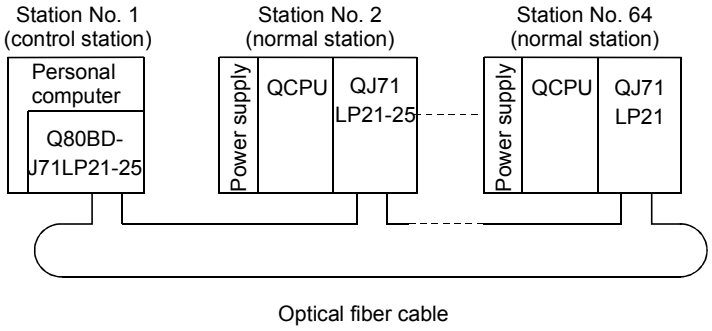
2 - 2

2.2 Single Network System

A single network system is one system that connects the control station and the normal stations with an optical fiber cable or a coaxial cable.

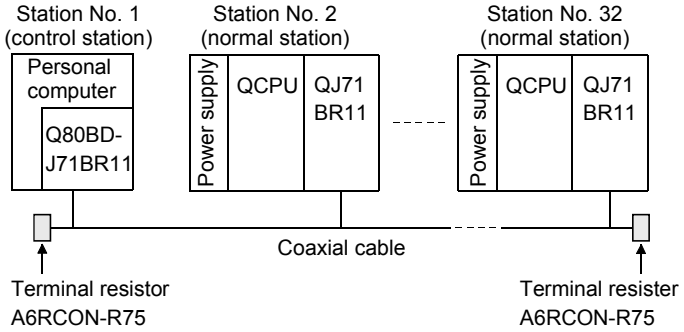
2.2.1 Optical loop system

In the optical loop system, 1 control station and 63 normal stations (a total of 64 stations) can be connected. Any station number can be assigned as the control station. However, only one station can be set as the control station per system.
In the following sample system, station number 1 has been assigned as the control station.



2.2.2 Coaxial bus system

In the coaxial bus system, 1 control station and 31 normal stations (a total of 32 stations) can be connected. As in the optical loop system, any station number can be assigned as the control station. However, only 1 station can be assigned as the control station per system.



2.2.3 Setting items

In a single network system, the items which need to be set in the case that the MELSECNET/H board is used as the control station or normal station are as follows. MELSECNET/H board settings are set by the MNETH Utility.

Setting item		Control station	Normal station	Reference section
Channel setting		△	△	Section 9.2.2
Network No.		○	○	Section 9.2.3
Group No.		△	△	
Station No.		○	○	
Control station/ Normal station		○	○	
Mode Setting		○	○	
Routing parameter setting		×	×	Section 9.2.4
Common parameter setting	B, W setting	○	×	Section 9.2.5
	X, Y setting	○	×	
	Reserved station setting	○	×	
	Supplementary setting	△	×	
Opposite party setting (Logical station No.)		△	△	Section 9.2.10
Driver setting		△	△	Section 9.2.11

○: Setting necessary △: Set as necessary ×: Setting unnecessary

2.2.4 Usable device ranges

The MELSECNET/H board can be used within the following device ranges for the following devices on the MELSECNET/H board.

Device	Usable range	
LB	0H to 3FFFH (16384 points)	The function expansion areas of 2000H to 3FFFH are used for the low-speed cyclic transmission. All areas can be used for the normal cyclic transmission. The use ranges for each MELSECNET/H board and network module need to be assigned in the parameter settings for the control station.
LW	0H to 3FFFH (16384 points)	
LX	0H to 1FFFH (8192 points)	The use ranges for each MELSECNET/H board and network module need to be assigned in the parameter settings for the control station.
LY	0H to 1FFFH (8192 points)	

If the MELSECNET/H board is used in the MELSECNET/10 mode, the device range for LB/LW becomes 0H to 1FFFH (8192 points).

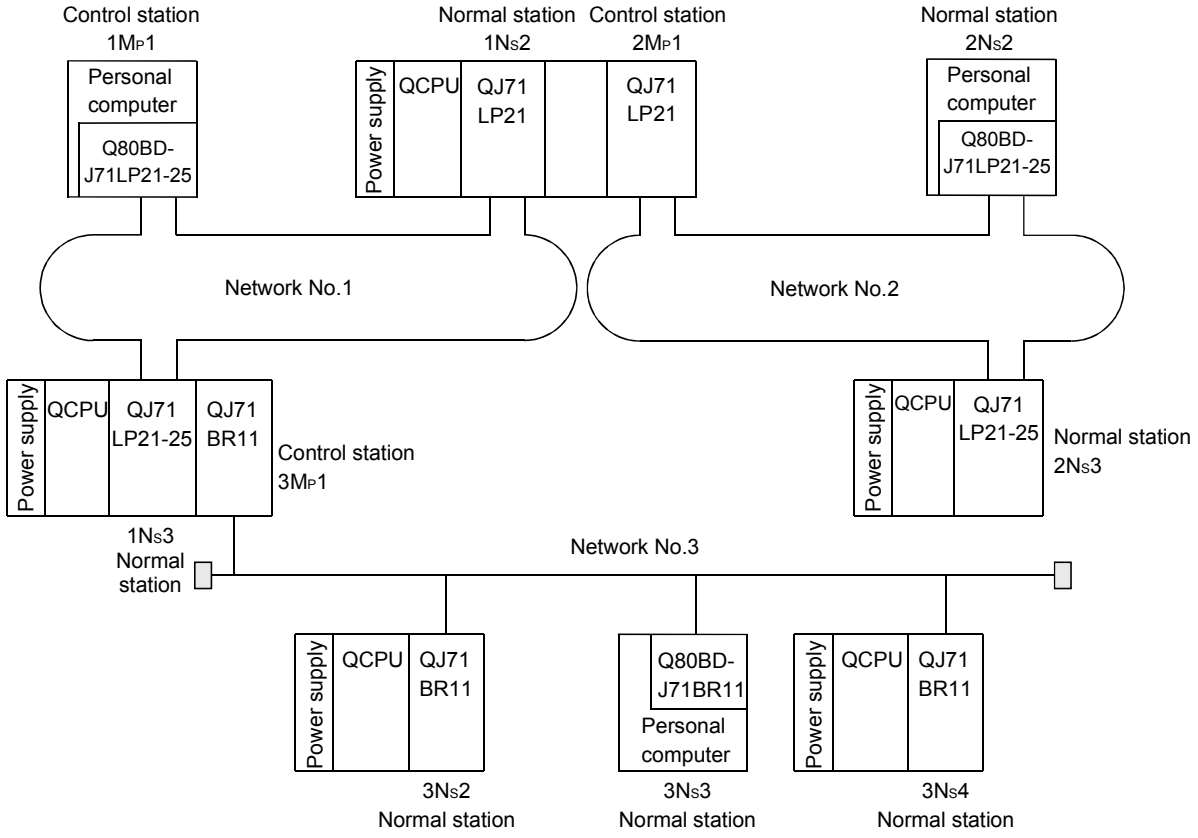
2.3 Multiple Network System

A multiple network system is a system where multiple networks are connected by relay stations.

POINT
(1) The network No. can be set at any desired No. in the range 1 to 239.
(2) The MELSECNET/H board cannot be used as a relay station. Please use the network module as a relay station.

2.3.1 Configuration

The following example shows how three networks can be connected.



2.3.2 Setting items

Setting items in the case that the MELSECNET/H board is used as a control station or normal station in a multiple network system are explained below.
MELSECNET/H board settings are performed by the MNETH Utility.

Setting item		Control station	Normal station	Reference section
Channel setting		△	△	Section 9.2.2
Network No.		○	○	Section 9.2.3
Group No.		△	△	
Station No.		○	○	
Control station/ Normal station		○	○	
Mode setting		○	○	
Routing parameter setting		△	△	Section 9.2.4
Common Parameter Setting	B, W setting	○	×	Section 9.2.5
	X, Y setting	○	×	
	Reserved station setting	○	×	
	Supplementary setting	△	×	
Opposite party setting (Logical station No.)		△	△	Section 9.2.10
Driver setting		△	△	Section 9.2.11

2.3.3 Usable device range

The same device range as is used for a single network system (section 2.2.4) can be used.

2.4 If used in a Multiple CPU System or Redundant CPU System

For cautions in the case of installing MELSECNET/H in a multiple CPU system or redundant CPU system, refer to "Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)."

POINT

When accessing a multiple CPU system or Redundant CPU system, use the MELSECNET/H board and network module of the following function versions.

	MELSECNET/H board	Programmable controller side network module
Access to multiple CPU system	All versions available	Function version B or later
Access to Redundant CPU system	Function version D or later ＊1	Function version D or later

＊1: When using a MELSECNET/H board of function version D or earlier, access to a redundant CPU is not performed normally.

2.5 Operating Environment

The following table shows the operating environment for the MELSECNET/H board. For details on the personal computer and operating system, refer to the instructions on the following pages.

Item		Description
Personal computer		Windows® supported personal computer
	CPU	System requirements of the operating system must be met.
	Required memory	
	PCI bus specifications	For Q80BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, and Q80BD-J71BR11 • Compliant with PCI standard Rev.2.2 (5V DC, 32-bit bus, Basic clock : 33MHz)
	PCI Express® Bus specifications	For Q81BD-J71LP21-25 • Compliant with PCI Express® standard Rev.1.0a (3.3 V DC, Link width : 1lane, Basic clock : 100MHz)
Operating system (English version) ＊1 ＊2		Microsoft® Windows® 95 Operating System ＊3 Microsoft® Windows® 98 Operating System ＊3 Microsoft® Windows® 98 Second Edition Operating System ＊3 Microsoft® Windows NT® Workstation Operating System Version 4.0, Service Pack3 or higher ＊3 Microsoft® Windows® 2000 Professional Operating System ＊3 Microsoft® Windows® XP Professional Operating System Microsoft® Windows Server® 2003 R2, Standard Edition Operating System Microsoft® Windows Server® 2003 R2, Enterprise Edition Operating System Microsoft® Windows Server® 2003 R2, Standard x64 Edition Operating System Microsoft® Windows Server® 2003 R2, Enterprise x64 Edition Operating System Microsoft® Windows Vista® Home Basic Operating System Microsoft® Windows Vista® Home Premium Operating System Microsoft® Windows Vista® Business Operating System Microsoft® Windows Vista® Ultimate Operating System Microsoft® Windows Vista® Enterprise Operating System Microsoft® Windows Server® 2008 Standard Operating System Microsoft® Windows Server® 2008 Enterprise Operating System Microsoft® Windows Server® 2008 Standard x64 Edition Operating System Microsoft® Windows Server® 2008 Enterprise x64 Edition Operating System Microsoft® Windows Server® 2008 R2 Standard Operating System Microsoft® Windows Server® 2008 R2 Enterprise Operating System Microsoft® Windows® 7 Home Premium (32-bit version / 64-bit version) Operating System Microsoft® Windows® 7 Professional (32-bit version / 64-bit version) Operating System Microsoft® Windows® 7 Ultimate (32-bit version / 64-bit version) Operating System Microsoft® Windows® 7 Enterprise (32-bit version / 64-bit version) Operating System Microsoft® Windows Server® 2012 R2 Standard Operating System Microsoft® Windows® 8 (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8 Pro (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8 Enterprise (32-bit version / 64-bit version) Operating System
Display		Resolution: 800×600 dot or higher (Recommended: 1024×768 dot)
Available hard disk space		1GB or more
Disk drive		CD-ROM disk drive

Item	Description
Programming language ∗2 (English version)	Microsoft® Visual Basic® 5.0 Microsoft® Visual Basic® 6.0 Microsoft® Visual Basic® .NET 2003 Microsoft® Visual Studio® 2005 Visual Basic® Microsoft® Visual Studio® 2008 Visual Basic® Microsoft® Visual Studio® 2010 Visual Basic® Microsoft® Visual Studio® 2012 Visual Basic® Microsoft® Visual C++® 5.0 Microsoft® Visual C++® 6.0 Microsoft® Visual C++® .NET 2003 Microsoft® Visual Studio® 2005 Visual C++® Microsoft® Visual Studio® 2008 Visual C++® Microsoft® Visual Studio® 2010 Visual C++® Microsoft® Visual Studio® 2012 Visual C++®

∗1: Windows® XP (64-bit version) and Windows Vista® (64-bit version) are not supported.

∗2: For a combination of the operation system and the programming language, refer to the Microsoft® Knowledge Base.

∗3: Not supported by SW0DNC-MNETH-B version 26C or later. When using one of these operating system, use SW0DNC-MNETH-B version 25B or earlier.SW0DNC-MNETH-B version 25B and its supported manual are stored on the CD-ROM of this product. (refer to Appendix 7)

(1) Instructions for personal computer

(a) PCI standard

Using a personal computer not compliant with the PCI or PCI Express® standard may result in a problem due to poor electrical contact, erroneous operation, etc.

For details on the number of boards that can be installed, installation slot and occupied slots, refer to Section 3.2.

(b) The functions being added

Operating environment	Supported version of SW0DNC-MNETH-B
Hyper-Threading technology	11M or later
Multiprocessor	19V or later

(2) Instructions for operating system

(a) Supported version of SW0DNC-MNETH-B

Operating system	Supported version of SW0DNC-MNETH-B	
	Q80BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE, Q80BD-J71BR11	Q81BD-J71LP21-25
Windows® 95, Windows® 98, Windows NT®	Version 25B or earlier	(Not supported)
Windows® 2000	Version 25B or earlier	From version 19V to 25B
Windows ® XP	Version 70H or later	Version 19V or later
Windows Server® 2003 R2 (32-bit version)	Version 19V or later	
Windows Server® 2003 R2 (64-bit version)	Version 23Z or later	
Windows Vista®	Version 17T or later	Version 19V or later
Windows Server® 2008 (32-bit version)	Version 21X or later	
Windows Server® 2008 (64-bit version), Windows Server® 2008 R2	Version 23Z or later	
Windows® 7 (32-bit version)	Version 21X or later	
Windows® 7 (64-bit version)	Version 23Z or later	
Windows Server® 2012, Windows® 8	Version 26C or later	

(b) User authority

Log on as a user having administrator authority.
Installation, uninstallation and usage of utilities are available only by the administrator's authority.

(c) The functions cannot be used

The following functions of operating system cannot be used. If an attempt is made to use any of the following functions, this product may not operate normally.

- Activating the application with Windows® compatible mode.
- Simplified user switch-over
- Remote desktop
- Large font size (Advanced setting of screen property)
- DPI setting other than 100%
  (set the size of text and illustration other than [smaller-100%])
- Power save mode (Standby, Hibernate, Sleep)
- Fast startup
- The language switching function set by Regional and Language Options
  Windows Touch
- Windows XP Mode
- Windows Touch or Touch
- Modern UI
- Client Hyper-V
- Server Core Installation

REMARK

- When exiting the operating system, always shut down the computer.
- The behavior of the board and the personal computer when the personal computer enters the power save mode differs according to the operating system. For details of error codes and messages when the power save mode set by a user or a program is entered, refer to Appendix 9.

(3) Instructions for user program

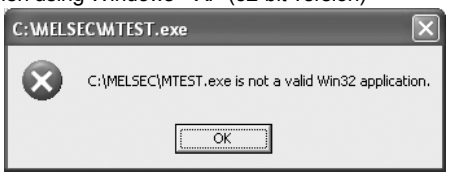
(a) Supported version of SW0DNC-MNETH-B

User program	Supported version of SW0DNC-MNETH-B
32-bit version user program *1	All versions
64-bit version user program *2	Version 23Z or later

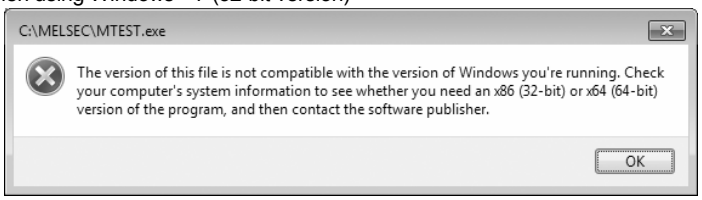
*1: Programs can be created and executed on the 64-bit version operating system.

*2: Programs can be created on the 32-bit version operating system, however, the following dialog box appears and cannot be executed.

<When using Windows® XP (32-bit version)>



<When using Windows® 7 (32-bit version)>


C:\MELSEC\MTEST.exe
The version of this file is not compatible with the version of Windows you're running. Check your computer's system information to see whether you need an x86 (32-bit) or x64 (64-bit) version of the program, and then contact the software publisher.
OK

(b) User programs created in the Japanese environment work only in the Japanese environment.

(c) User programs created in the English environment work only in the English environment.

MEMO

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3 SPECIFICATIONS

This section explains the MELSECNET/H board general specifications, performance specifications.

3.1 General Specifications

This section explains the MELSECNET/H board general specifications.

<table>
<tr><th>Item</th><th colspan="5">Specifications</th></tr>
<tr><td>Operating ambient temperature</td><td colspan="5">0 to 55 °C</td></tr>
<tr><td>Storage ambient temperature</td><td colspan="5">-25 to 75 °C</td></tr>
<tr><td>Operating ambient humidity</td><td colspan="5" rowspan="2">5 to 95 % RH, non-condensing</td></tr>
<tr><td>Storage ambient humidity</td></tr>
<tr><td rowspan="8">Vibration resistance</td><td rowspan="8">Compliant with JIS B 3502 and IEC 61131-2</td><td colspan="4">Under intermittent vibration</td></tr>
<tr><td>Frequency</td><td>Constant acceleration</td><td>Half amplitude</td><td>Sweep count</td></tr>
<tr><td>5 to 8.4 Hz</td><td>—</td><td>3.5 mm</td><td rowspan="2">10 times each in X, Y and Z directions</td></tr>
<tr><td>8.4 to 150 Hz</td><td>9.8m/s^2</td><td>—</td></tr>
<tr><td colspan="4">Under continuous vibration</td></tr>
<tr><td>Frequency</td><td>Constant acceleration</td><td>Half amplitude</td><td>Sweep count</td></tr>
<tr><td>5 to 8.4 Hz</td><td>—</td><td>1.75 mm</td><td rowspan="2">—</td></tr>
<tr><td>8.4 to 150 Hz</td><td>4.9m/s^2</td><td>—</td></tr>
<tr><td>Shock resistance</td><td colspan="5">Compliant with JIS B 3502 and
IEC 61131-2 (147 m/s^2, 3 times each in X, Y, and Z directions)</td></tr>
<tr><td>Operating atmosphere</td><td colspan="5">No corrosive gases</td></tr>
<tr><td>Operating altitude ＊1</td><td colspan="5">0 to 2000 m</td></tr>
<tr><td>Installation location</td><td colspan="5">Inside a control panel</td></tr>
<tr><td>Over-voltage category ＊2</td><td colspan="5">II or less</td></tr>
<tr><td>Pollution rate ＊3</td><td colspan="5">2 or less</td></tr>
</table>

＊1: Do not use or store the board under pressure higher than the atmospheric pressure of altitude 0m. Doing so may cause a malfunction.

＊2: This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within the premises. Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300 V is 2500 V.

＊3: This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used. Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensation must be expected occasionally.

REMARK

General specifications both MELSECNET/H board and a personal computer must be satisfied after installation.

3.2 Performance Specifications

MELSECNET/H Board performance specifications are shown below.

(1) Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE

Item		Specifications				
		Q80BD-J71LP21-25	Q81BD-J71LP21-25 ＊1	Q80BD-J71LP21S-25	Q80BD-J71LP21G	Q80BD-J71LP21GE
Maximum links in 1 network	LX/LY	8192 Points				
	LB	16384 Points (When in the MELSECNET/10 Mode ＊2: 8192 Points)				
	LW	16384 Points (When in the MELSECNET/10 Mode ＊2: 8192 Points)				
Maximum links in 1 station		• MELSECNET/H mode, MELSECNET/10 mode ＊2 {(LY + LB) / 8 + (2 × LW)} ≦ 2000 bytes • MELSECNET/H Extended mode ＊2 {(LY + LB) / 8 + (2 × LW)} ≦ 35840 bytes				
Communications rate ＊2		25 Mbps / 10 Mbps			10 Mbps	
Number of stations Connected to 1 network		64 Stations (Control station: 1; Normal station: 63)				
Connection cable		Optical fiber cable				
Total extension cable length		30km (98430 ft.)				
Between stations length ＊3	25 Mbps	SI optical cable : 200m (656.2 ft.) H-PCF optical cable : 400m (1312.4 ft.) Broad-band H-PCF optical cable : 1km (3281 ft.) QSI optical cable : 1km (3281 ft.)			—	—
	10 Mbps	SI optical cable : 500m (1640.5 ft.) H-PCF optical cable : 1km (3281 ft.) Broad-band H-PCF optical cable : 1km (3281 ft.) QSI optical cable : 1km (3281 ft.)			GI optical cable : 2km (6562 ft.)	62.5 GI optical cable : 2km (6562 ft.)
Maximum networks		239				
Maximum number of groups		32 (When in the MELSECNET/10 Mode: 9)				
Transmission channel format		Duplex loop				
Communications system		Token ring system				
Synchronization system		Frame synchronization system				
Encoding system		NRZI encoding (Non return to Zero inverted)				
Transfer format		HDLC Standard (Frame format)				
Error control system		CRC ($X^{16} + X^{12} + X^5 + 1$) and retry by overtime.				
RAS function		• Loop back function (optical loop system only) by abnormal detection and cable disconnection. • System down prevention through control station. • Error detection by the link special relay and link special register. etc.				
Transient transmission		N: N communications				
Special cyclic transmission		Low speed cyclic transmission				
Number of boards that can be installed		Maximum 4 boards				
Installation slot		PC PCI bus slot (half size)	PC PCI Express® X1, X2, X4, X8, X16 slot (half size)	PC PCI bus slot (half size)		
Exclusive slots		1 slot		2 slot	1 slot	
External power supply	Voltage	—		20.4 to 31.2 V DC	—	
	Current	—		0.16 A	—	
	Connector	—		Connector set (Accessory)	—	
	Suitable cable size	—		0.50 to 1.25 mm^2 [AWG#20-16]	—	
5 V DC Internal current consumption		0.46 A	—	0.46 A	0.45 A	
3.3 V DC Internal current consumption		—	0.95 A	—	—	
Weight		0.10 kg		0.20 kg	0.11 kg	

*1: The CPU usage may be higher compared to that of Q80BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BDJ71LP21G, Q80BD-J71LP21GE, or Q80BD-J71BR11. (For the solutions to slow PC performance, refer to Section 14.8.)
*2: MELSECNET/H board communications rate and Mode settings are performed using the MNETH Utility. (For details, refer to Section 9.2.3)
*3: L type and H type of the previous optical fiber cable (A-2-□) differ in the distances between stations. (For details, refer to Section 6.4.1)

(2) Q80BD-J71BR11

Item		Specifications	
		Q80BD-J71BR11	
Maximum links in 1 network	LX/LY	8192 Points	
	LB	16384 Points (When in the MELSECNET/10 Mode *1: 8192 Points)	
	LW	16384 Points (When in the MELSECNET/10 Mode *1: 8192 Points)	
Maximum links in 1 station		• MELSECNET/H mode, MELSECNET/10 mode *1 {(LY + LB) / 8 + (2 × LW)} ≤ 2000 bytes • MELSECNET/H Extended mode *1 {(LY + LB) / 8 + (2 × LW)} ≤ 35840 bytes	
Communications rate *1		10 Mbps	
Number of stations Connected to 1 network		32 Stations (Control station: 1; normal station: 31)	
Connection cable		Optical fiber cable	Coaxial cable
Total extension cable length in 1 network		Cable name: 3C-2V — Total extension cable length: 300 m *2; Length between stations: — Cable name: 5C-2V, 5C-FB — Total extension cable length: 500 m *2; Length between stations: — Can be extended to 2.5 km (8202.5 ft.) using a repeater unit (A6BR10, A6BR10-DC).	
Maximum networks		239	
Maximum number of groups		32 (When in the MELSECNET/10 Mode: 9)	
Transmission channel format		Single Bus	
Communications system		Token bus system	
Synchronization system		Frame synchronization system	
Encoding system		NRZI encoding (Non return to Zero inverted)	Manchester encoding
Transfer format		HDLC Standard (Frame format)	
Error control system		CRC (X16 + X12 + X5 + 1) and retry by overtime.	
RAS function		• Loop back function (optical loop system only) by abnormal detection and cable disconnection. • System down prevention through control station. • Error detection by the link special relay and link special register. etc.	
Transient transmission		N:N communications	
Special cyclic transmission		Low speed cyclic transmission	
Number of boards that can be installed		Maximum 4 boards	
Installation slot		PC PCI bus slot (half size)	
Exclusive slots		1 slot	
5 V DC Internal current consumption		0.67 A	
Weight		0.11 kg	

*1: MELSECNET/H board communications rate and Mode settings are performed using the MNETH Utility. (For details, refer to Section 9.2.3)
*2: Depending on the number of stations connected, there are limits to the cable length between stations. (For details, refer to Section 6.4.2)

3.3 Optical Fiber Cable Specification

For the optical fiber cable specification, refer to "Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)".

3.4 Coaxial Cable Specification

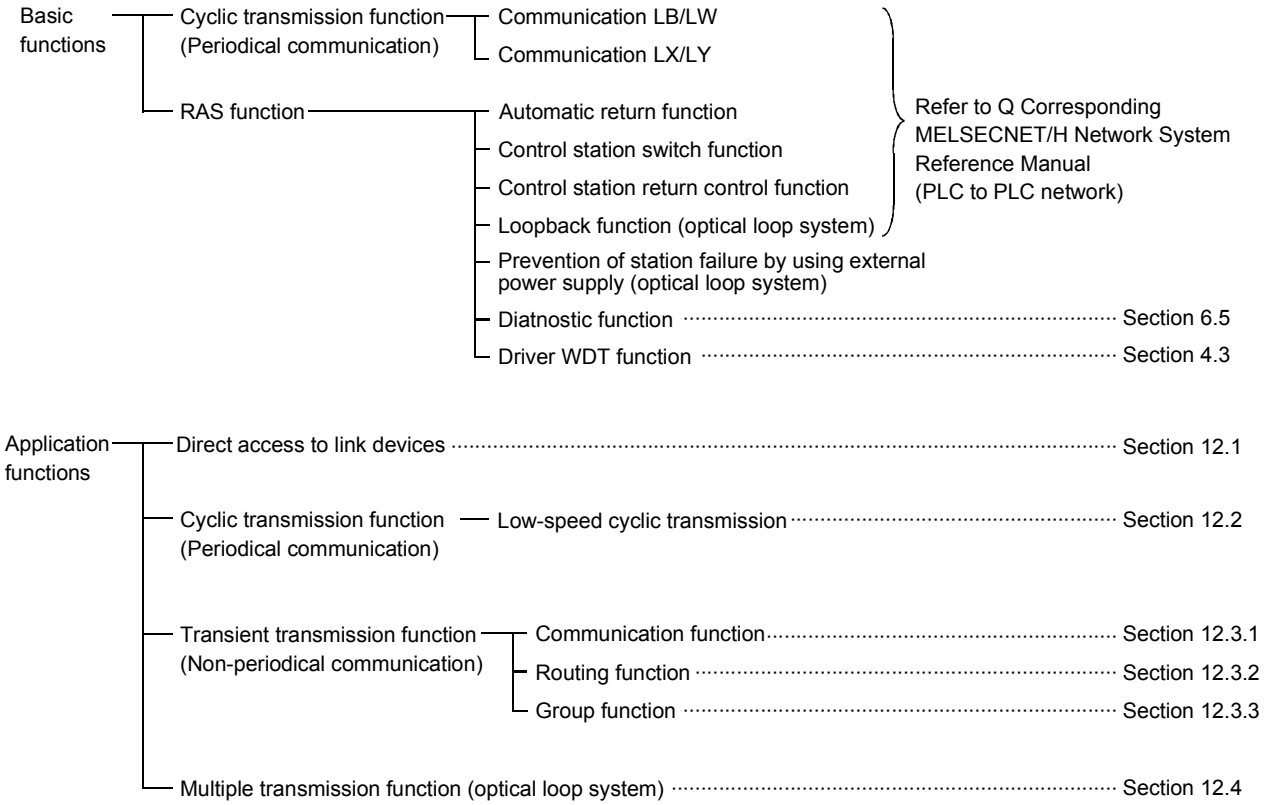
For the coaxial cable specification, refer to "Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)".

4 FUNCTION

This chapter explains the function of MELSECNET/H board.

4.1 Function List

The following flowchart shows the function list for MELSECNET/H board.


Basic functions
Cyclic transmission function (Periodical communication)
Communication LB/LW
Communication LX/LY
RAS function
Automatic return function
Control station switch function
Control station return control function
Loopback function (optical loop system)
Refer to Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)
Prevention of station failure by using external power supply (optical loop system)
Diatnostic function ····· Section 6.5
Driver WDT function ····· Section 4.3
Application functions
Direct access to link devices ····· Section 12.1
Cyclic transmission function (Periodical communication)
Low-speed cyclic transmission ····· Section 12.2
Transient transmission function (Non-periodical communication)
Communication function ····· Section 12.3.1
Routing function ····· Section 12.3.2
Group function ····· Section 12.3.3
Multiple transmission function (optical loop system) ····· Section 12.4

4 - 1

4.2 Specifications of the Link Data Sending/Receiving Processing Time

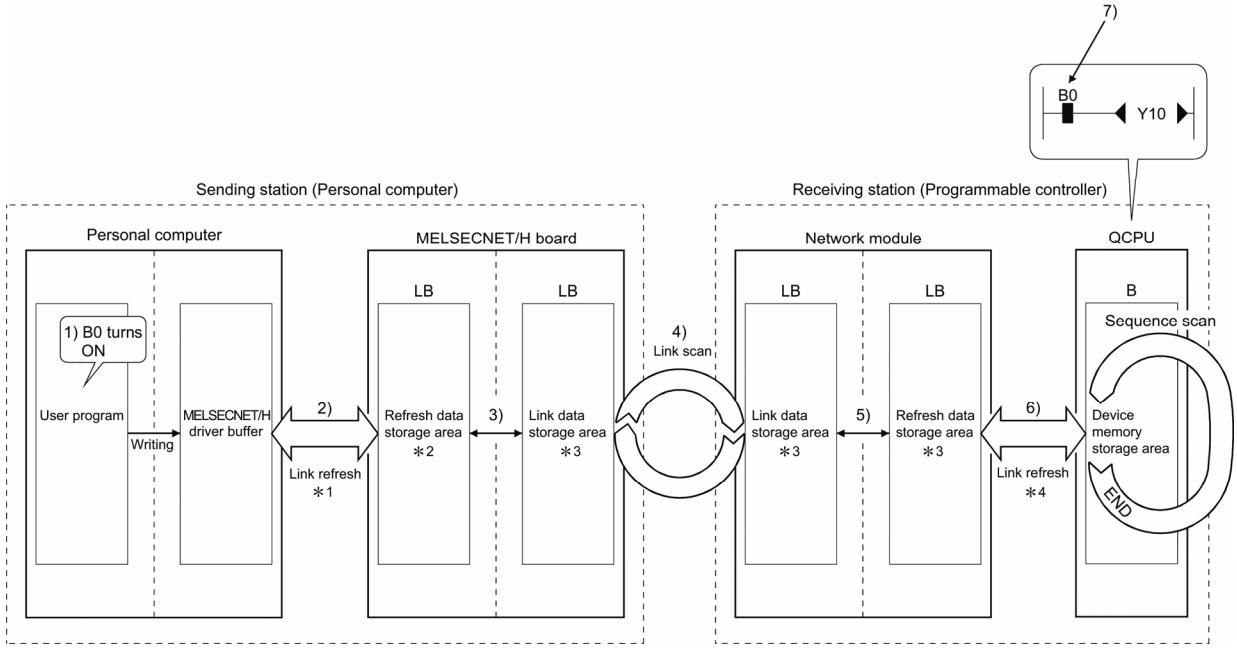
This section explains the link data sending/receiving processing in the MELSECNET/H network system with MELSECNET/H board.

4.2.1 Link data sending/receiving processing

(1) Link data sending/receiving processing

In the cyclic transmission, communication is performed using the LB/LW/LX/LY devices of the network module and MELSECNET/H board.
This section explains the case when the link relay (B) is used on the personal computer side.

1) B0 on the sending station (personal computer) turns on.
2) By a link refresh, the B0 information is stored in the refresh data storage area (LB) of the MELSECNET/H board.
3) The B0 information in the refresh data storage area (LB) is stored in the link data storage area (LB).
4) By a link scan, the B0 information in the link data storage area (LB) is stored in the link data storage area (LB) of the network module on the receiving station.
5) The B0 information in the link data storage area (LB) is stored in the refresh data storage area (LB).
6) By a link refresh, the B0 information is stored in the device memory storage area (B) of the CPU module.
7) B0 on the receiving station turns on.

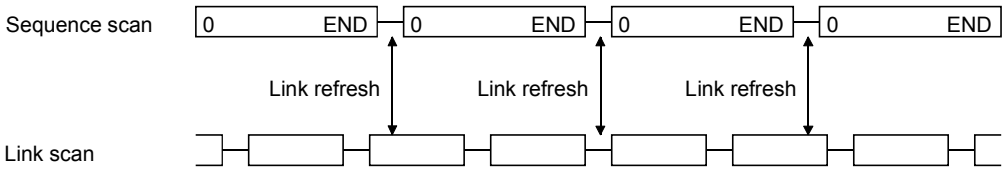


*1: The link refresh interval is set on the "Driver" screen in the MNETH Utility.
*2: Set by the GX Developer's "Station Inherent Parameters." (If not set, they are stored in the common parameters state.)
*3: If the MELSECNET/H board is a control station, it is set in the "Common Parameter Setting" screen in the MNETH Utility. If the network module is a control station, it is set in the GX Developer's "Common Parameters."
*4: Set in the GX Developer's "Network Refresh Parameters."

(2) Link scan and link refresh

The link scan is executed "asynchronous" with the sequence scan of the CPU module.

The link refresh is executed by the "END processing" of the CPU module.



(3) Link data when a communication error station or communication stop station occurs on the network

When a communication error or communication stop station occur on the network during the data link, the receive data from those stations immediately before the error occurrence is retained.

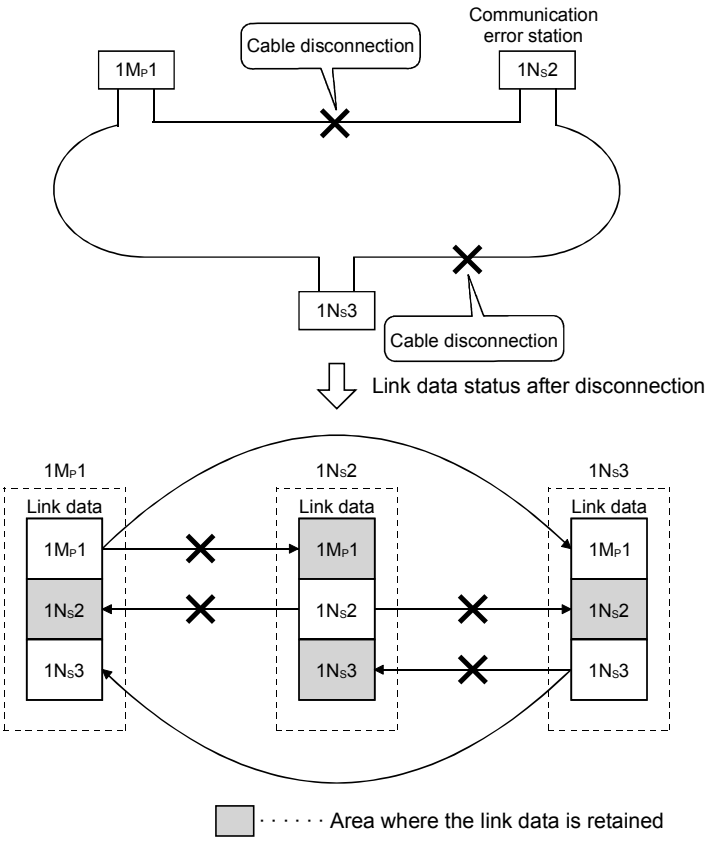
(A "communication stop station" refers to a station whose cyclic transmission has been stopped by a peripheral device.)

(a) The receive data from a communication error station or communication stop station is retained by a normally communicating station.

(b) The receive data from other station is retained by a communication stop station.

(Example)

When a communication error has occurred to 1NS2 due to cable disconnection



4 - 3

(4) SB/SW when a communication error station/communication stop station occurs on the network

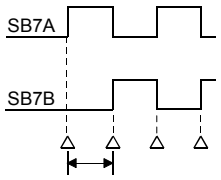
The status of whether there are any communication error/communication stop stations on the network can be checked with the link special relay/register (SB/SW).

Use them as interlocks for programs.

For interlock program examples, refer to the following manual.

Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)

Link special relays and registers

Link special relay/register	Description	Signal status	
		Off	On
SB20	Indicates the communication status between MELSECNET/H board and personal computer.	Normal	Abnormal
SB47	Shows the baton pass execution status of the host.	The baton pass is being executed	The baton pass is stopped
SB49	Shows the cyclic transmission status of the host.	Normal	Abnormal
SB70	Shows the baton pass execution status of all stations (including the host). However, it only shows the status for the number of stations set with parameters.	The baton pass is being executed on all stations	Occurrence of communication stop station
SW70 to 73	Shows the baton pass execution status of each station. Each bit corresponds to the status of each station.	The baton pass is being executed	The baton pass is stopped
SB74	Shows the cyclic transmission status of all stations (including the host). However, it only shows the status for the number of stations set with parameters.	All stations normal	Occurrence of abnormal station
SW74 to 77	Shows the cyclic transmission status of each station. Each bit corresponds to the status of each station.	Normal	Abnormal
SB7A, 7B	Shows the low-speed cyclic transmission status. The transmission completion is indicated by the on/off status of either bit SB7A or 7B.		
SW1FC to SW1FF	Shows the redundant CPU system status (Control or Standby) of each station. Each bit corresponds to each station status.	Control system *1	Standby system

*1: Stations in other than the redundant CPU system configuration are OFF.

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4.3 Driver WDT function

Driver WDT function monitors the operation of the software (operating system, driver) inside the hardware by the timer function on MELSECNET/H board.
When the driver cannot reset the timer of the board within the specified driver WDT monitoring time, MELSECNET/ board detects driver WDT error.
Driver WDT function detects driver operation delay due to the access error from the driver to MELSECNET/H board or system high load.

(1) Driver WDT settings

For the setting method, refer to section 9.2.11.

REMARK

The driver WDT function is set to invalid as a default.

(2) When the driver WDT error has occurred

The following shows the operation when driver WDT error has occurred.

1) MELSECNET/H board and the driver stop communication and are disconnected from the network in order to avoid an erroneous output.
   A CPU stop error occurs when checking the MELSECNET/H board from other station on which the driver WDT error has occurred.
2) RUN LED flicks and SD LED turns ON on the MELSECNET/H board.
3) "-28158 (9202H) Driver WDT error" occurs when accessing MELSECNET/H board from the application program in which the MELSECNET/H utility and MELSEC data link library function are used.

POINT

(1) When the multiple applications in which MELSEC data link library is used are executed, driver WDT error is returned to all the programs. However, only the MELSECNET/H board in which the driver WDT error has occurred is recognized as an error station on the network.
When using driver WDT function, set the monitoring timer considering the margin of the personal computer load.
(2) For the troubleshooting, refer to section 14.7.2.

MEMO

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5 EMC AND LOW VOLTAGE DIRECTIVE

Compliance with the EMC Directive, which is one of the EU directives, has been mandatory for the products sold within EU member states since 1996 as well as compliance with the Low Voltage Directive since 1997.
To prove the compliance, manufactures must issue an EC Declaration of Conformity and the products must bear a CE marking.

(1) Sales representative in EU member states

The authorized representative in EU member states will be:
Company name: Mitsubishi Electric Europe BV
Address: Gothaer Strasse 8, 40880 Ratingen, Germany

5.1 Measures to comply with the EMC Directive

The EMC Directive sets two requirements for compliance: emission (conducted and radiated electromagnetic energy emitted by a product) and immunity (the ability of a product to not be influenced by externally generated electromagnetic energy).
This section summarizes the precautions for machinery constructed with the MELSECNET/H board to comply with the EMC Directive.
These precautions are based on the requirements of the EMC Directive and the harmonized standards. However, they do not guarantee that the entire machinery constructed according to the descriptions complies with the EMC Directive.
The manufacture of the machinery must determine the testing method for compliance and declare conformity to the EMC Directive.

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5.1.1 EMC Directive related standards

The standards applicable to the EMC Directive are listed below.
All test items were tested by installing each device on a personal computer bearing a CE certification logo.

(1) Emission requirements

Standard	Test item	Test description	Value specified in standard
EN61131-2 : 2007	CISPR16-2-3 Radiated emission ＊1	The electromagnetic wave which the product emits to the external space is measured.	• 30M-230MHz QP: 40dB V/m (10m in measurement range) ＊2 • 230M-1000MHz QP: 47dB V/m (10m in measurement range)
	CISPR16-2-1, CISPR16-1-2 Conducted emission ＊1	The noise level which the product emits to the power line is measured.	• 0.15 to 0.5MHz, QP: 79dB, Mean: 66dB ＊2 • 0.5 to 30MHz, QP: 73dB, Mean: 60dB

＊1: The tests were conducted installed in a control panel.
＊2: QP: Quasi-peak value, Mean: Average value

(2) Immunity requirements

Standard	Test item	Test description	Value specified in standard
EN61131-2 : 2007	EN61000-4-2 Electrostatic discharge immunity ＊1	An electrostatic discharge is applied to the enclosure of the equipment.	• 8kV Air discharge • 4kV Contact discharge
	EN61000-4-3 Radiated, radio-frequency, electromagnetic field immunity ＊1	An electric field is radiated to the product.	80% AM modulation@1kHz • 80 to 1000MHz: 10V/m • 1.4 to 2.0GHz: 3V/m • 2.0 to 2.7GHz: 1V/m
	EN61000-4-4 Fast transient burst immunity ＊1	Burst noise is applied to power lines and signal lines.	• AC/DC power, I/O power, and AC I/O (unshielded) lines: 2kV • DC I/O, analog, and communication lines: 1kV
	EN61000-4-5 Surge immunity ＊1	Lightning surge is applied to power lines and signal lines.	• AC power, AC I/O power, and AC I/O (unshielded) lines: 2kV CM, 1kV DM • DC power and DC I/O power lines: 0.5kV CM, 0.5kV DM • DC I/O, AC I/O (shielded), analog, communication: 1kV CM
	EN61000-4-6 Conducted RF immunity ＊1	High-frequency noise is applied to power lines and signal lines.	0.15 to 80MHz, 80% AM modulation @1kHz, 10Vrms
	EN61000-4-8 Power-frequency magnetic field immunity ＊1	The product is immersed in the magnetic field of an induction coil.	50Hz/60Hz, 30A/m
	EN61000-4-11 Voltage dips and interruption immunity ＊1	Power voltage is momentarily interrupted.	• 0%, 0.5 period, starting at zero-crossing • 0%, 250/300 period (50/60Hz) • 40%, 10/12 period (50/60Hz) • 70%, 25/30 period (50/60Hz)

＊1: The tests were conducted installed in a control panel.

5.1.2 Installation in a control panel

The installation in the control board ensures safety as well as effective shielding of personal computer-emitted electromagnetic noise.

(1) Control panel

(a) Use a conductive control panel.

(b) Mask off the area used for grounding when securing the top or bottom plate to the control panel using bolts.

(c) To ensure electrical contact between the inner plate and the control panel, mask off the bolt installation areas of an inner plate so that conductivity can be ensured in the largest possible area.

(d) Ground the control panel with a thick ground cable so that low impedance can be ensured even at high frequencies.

(e) Keep the diameter of the holes on the control panel to 10cm or less. If the diameter is larger than 10cm, electromagnetic wave may be emitted. In addition, because electromagnetic wave leaks through a clearance between the control panel and its door, reduce the clearance as much as possible. Use of EMI gaskets (sealing the clearance) can suppress undesired radiated emissions.

The tests by Mitsubishi were conducted using a control panel having the damping characteristics of 37dB (maximum) and 30dB (average) (measured at 3m distance, 30 to 300MHz).

(2) Wiring power and ground cables

The power supply cable and ground cable for a personal computer should be laid out as follows:

(a) Provide a ground point to the control panel near the power supply module. Ground the LG and FG terminals of the power supply module to the ground point with the thickest and shortest ground cable possible (30cm or shorter).

(b) Twist the ground cable leading to the ground point with the power supply cable. By twisting it with the ground cable, the noise leaking from the power supply cable may be grounded at a higher rate. However, twisting the power supply cable with the ground cable may not be necessary if a noise filter is installed on the power supply cable.

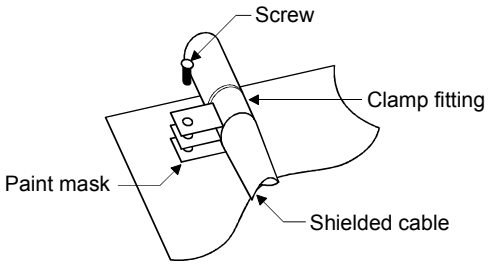
5.1.3 Cables

Use a shielded cable for the cable extended out of the control panel.
If a shielded cable is not used or not grounded correctly, the noise immunity will not meet the required value.

(1) Grounding a shield cable

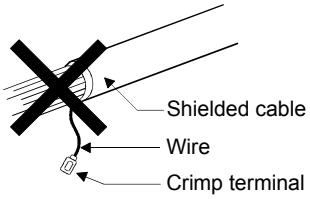
(a) Ground the shield of the shield cable as near the exit as possible from the control panel.
If the ground point is not near the outlet, the cables after the ground point will cause electromagnetic induction, and will generate a higher harmonic noise.

(b) Ground the exposed shield to large area on the control panel. A clamp fitting can be used as shown below.
In this case, mask off the inner wall surface of the control panel, where comes in contact with the fitting.



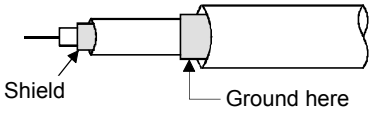
POINT

Grounding with a vinyl-coated wire soldered onto the shield of the shielded cable as shown below is not recommended.
Doing so will raise the high-frequency impedance, resulting in loss of the shielding effect.



(2) Treatment of the coaxial cable ground

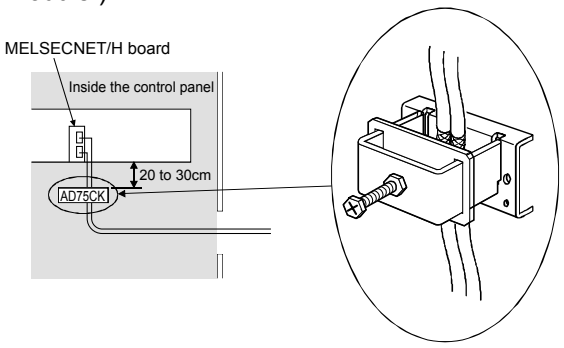
(a) Always use a double-shielded coaxial cable (MITSUBISHI CABLE : 5C-2V-CCY) for the coaxial cables Q80BD-J71BR11. Ground the double-shielded coaxial cable by connecting its outer shield to the ground.
Refer to (1) for the grounding of the shield.



(b) Make sure to install a ferrite core for the cable.

(3) Grounding cables with a cable clamp

Ground the shield of the external wiring cable to the control panel with the AD75CK cable clamp (Mitsubishi).(Ground the shield within 20 to 30cm from the module.).



For details on the AD75CK, refer to the following.

• AD75CK-type Cable Clamping Instruction Manual

5.1.4 Ferrite core

Ferrite core is effective for reducing radiated noise in the 30MHz to 100MHz frequency band.

It is recommended to install a ferrite core if a shield cable extended out of the control panel does not provide sufficient shielding effects.

Install a ferrite core to the cable in the position immediately before the cable is extended out of the control panel. If the installation position is not appropriate, the ferrite core will not produce any effect.

(Ferrite core used for the tests conducted by Mitsubishi: TDK ZCAT3035-1330)

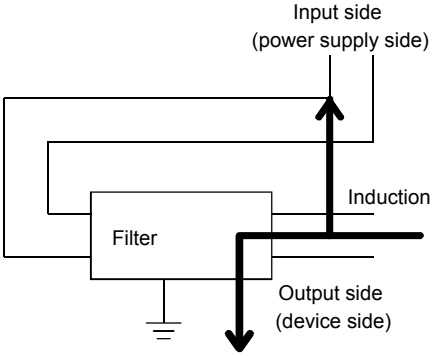
5.1.5 Noise filter (power supply line filter)

Noise filter is effective for reducing conducted noise in the 10MHz or less frequency. (Use of a noise filter can suppress noise.)

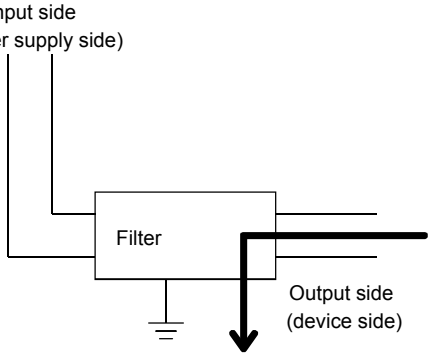
The installation precautions are described below.

(1) Do not bundle the cables on the input side and output side of the noise filter.

If bundled, the output side noise will be induced into the filtered cable on the input side.



Noise will be induced when the input and output cables are bundled.



Separately install the input and output cables.

(2) Ground the ground terminal of the noise filter to the ground point of the control panel with the shortest ground wire possible (approximately 10cm).

5.2 Requirements for Conformance to Low Voltage Directive

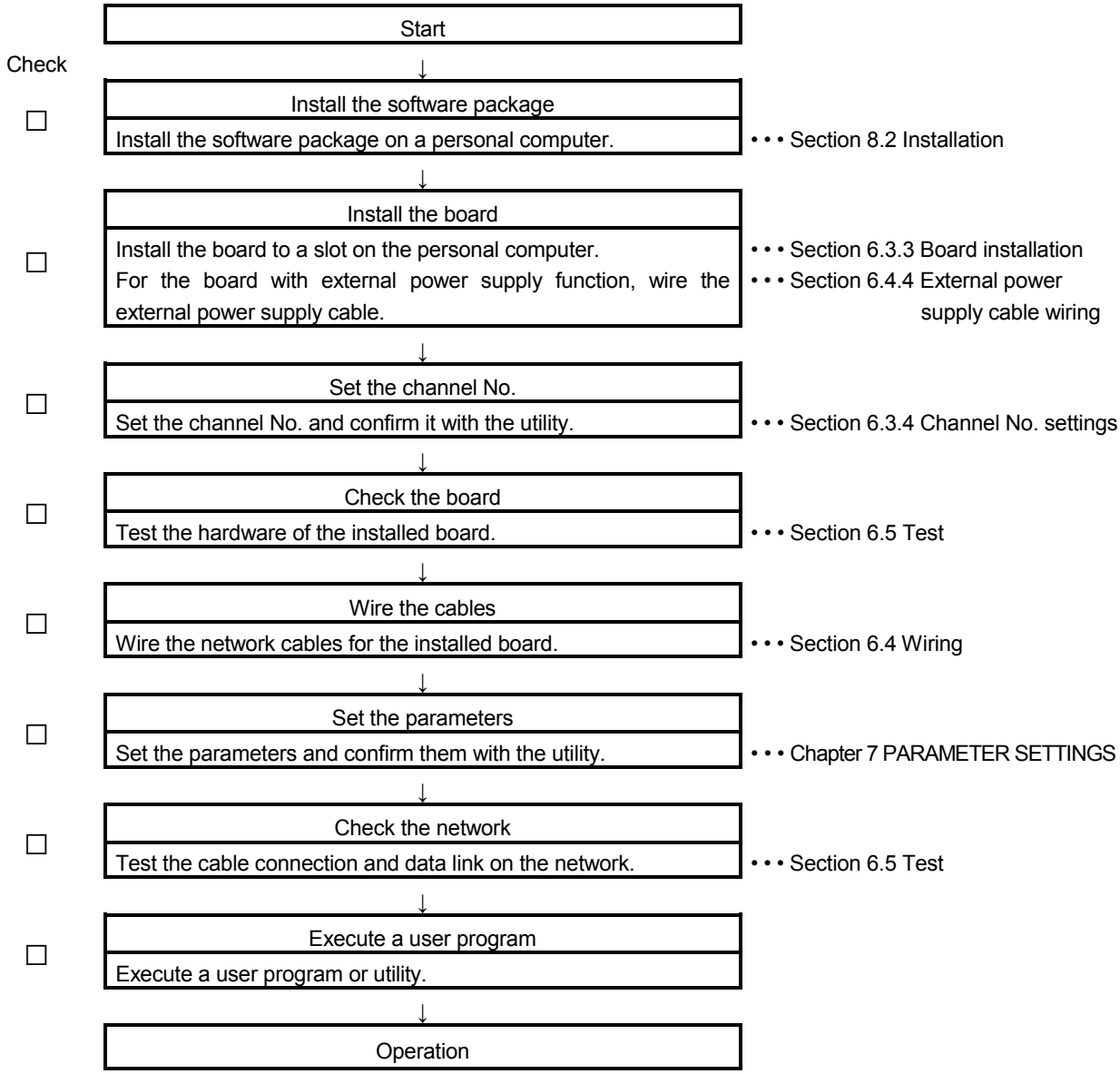
The MELSECNET/H board is out of the requirement for conformance to the Low Voltage Directive, since it does not use the power supply in the range of 50 to 1000V AC and 75 to 1500V DC.

6 PROCEDURE AND SETTINGS UP TO THE POINT OF OPERATION

This section explains the operating procedure up to the point the MELSECNET/H board is operated.

6.1 Procedure Up to the Point of Operation

An outline of the procedure up to the point of MELSECNET/H board operation is explained below.


Start
Check
Install the software package
Install the software package on a personal computer.
• • • Section 8.2 Installation
Install the board
Install the board to a slot on the personal computer.
• • • Section 6.3.3 Board installation
For the board with external power supply function, wire the external power supply cable.
• • • Section 6.4.4 External power supply cable wiring
Set the channel No.
Set the channel No. and confirm it with the utility.
• • • Section 6.3.4 Channel No. settings
Check the board
Test the hardware of the installed board.
• • • Section 6.5 Test
Wire the cables
Wire the network cables for the installed board.
• • • Section 6.4 Wiring
Set the parameters
Set the parameters and confirm them with the utility.
• • • Chapter 7 PARAMETER SETTINGS
Check the network
Test the cable connection and data link on the network.
• • • Section 6.5 Test
Execute a user program
Execute a user program or utility.
Operation

REMARK

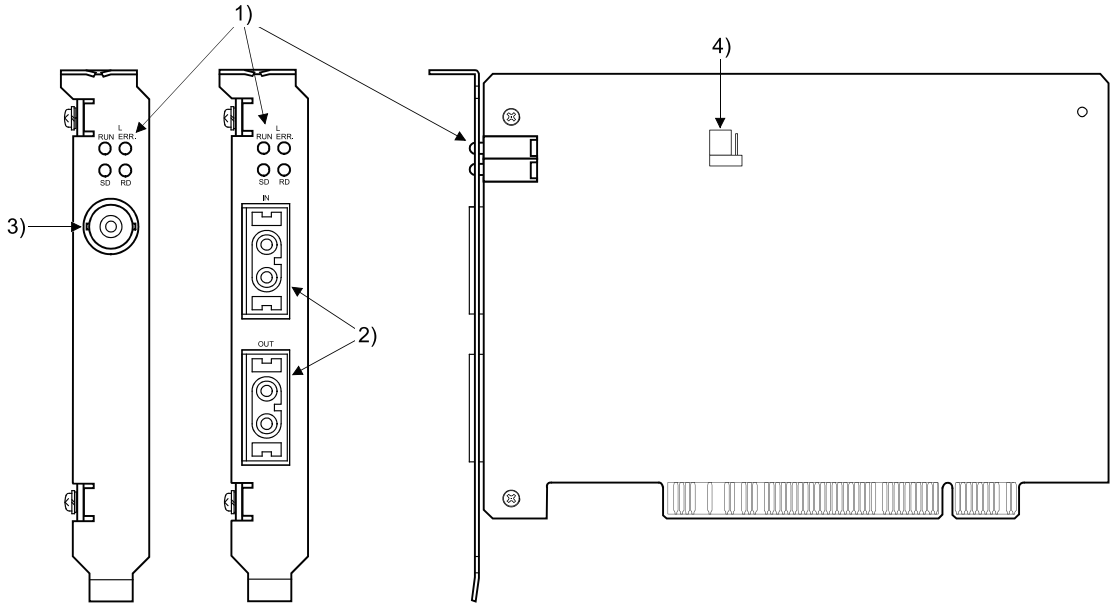
It is necessary to perform settings on the control station side in order to use the MELSECNET/H board as a normal station. Set the control station side as required. Refer to manuals listed below for the setting on the control station side.

- Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)
- For QnA/Q4AR MELSECNET/10 Network System Reference Manual

6.2 Part Names and Settings

The names of each part of the MELSECNET/H board and their settings are explained below.

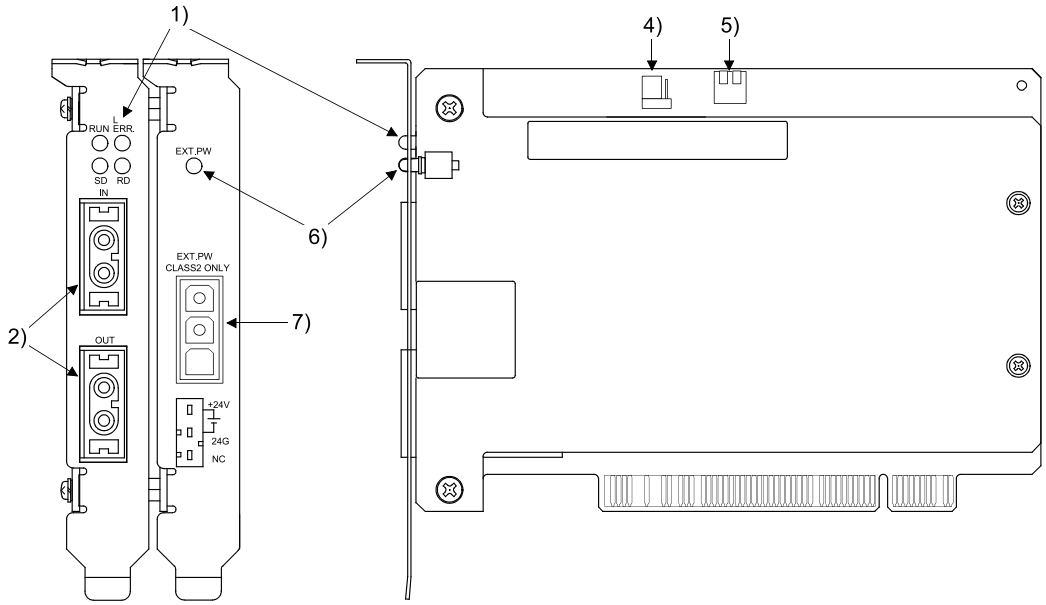
<Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21G, Q80BD-J71LP21GE, Q80BD-J71BR11>

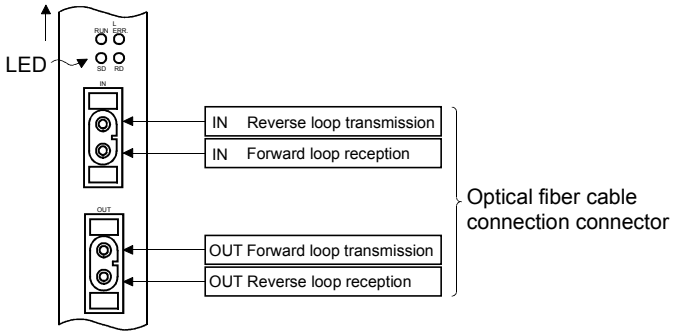
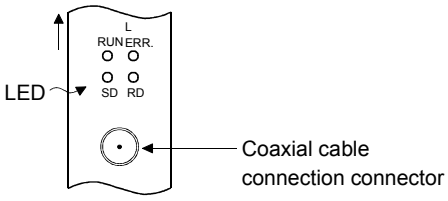
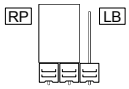
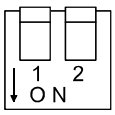
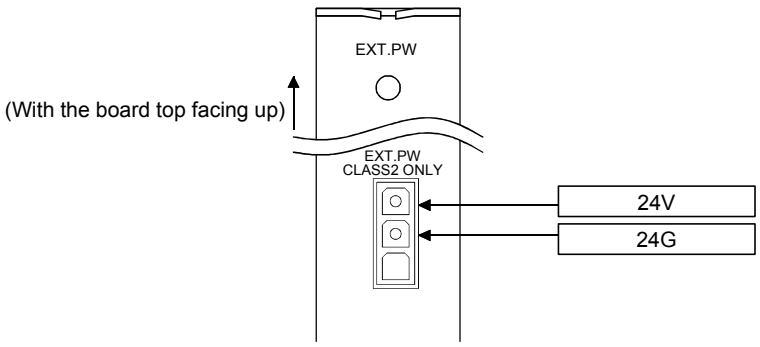


Q80BD-J71BR11

Q80BD-J71LP21-25
Q81BD-J71LP21-25
Q80BD-J71LP21G
Q80BD-J71LP21GE

<Q80BD-J71LP21S-25>



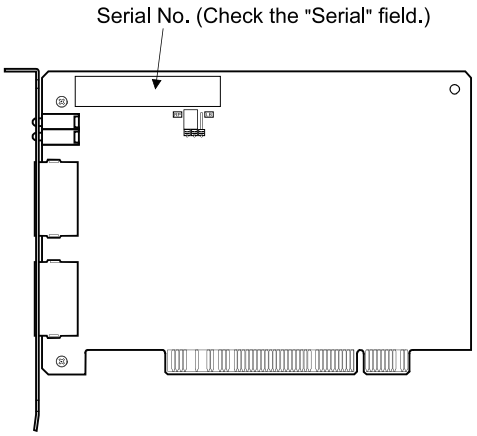
No.	Name	Description
1)	Indicator LED	Indicates the operating status of the MELSECNET/H board. Refer to (1) in this Section.
2)	Connector for connecting optical fiber cable	Connector for connecting optical fiber cable. The cable terminal is as shown below.  Refer to Section 6.4, "Cable Connections." for wiring of the optical fiber cable.
3)	Connector for connecting coaxial cable	Connector for connecting coaxial cable. The cable terminal is as shown below. Refer to Section 6.4, "Cable Connections." for wiring of the coaxial cable. 
4)	Jumper *1 	Use prohibited (Fixed to RP side)
5)	DIP switch 	Use prohibited (Fixed to OFF)
6)	External power supply indicator LED	Indicates the status of external power supply. Refer to (2) in this Section.
7)	External power supply cable connector	Connector for connecting external power supply cable The cable terminal assignment is as shown below. 

*1: The jumper is provided for all of the Q80BD-J71LP21S-25, Q81BD-J71LP21-25, and the Q80BD-J71LP21-25 and Q80BD-J71LP21G of the following serial No.

Q80BD-J71LP21-25:
The sixth digit (from the left) of the serial No. is 7 or higher.
*****[7]*********-*

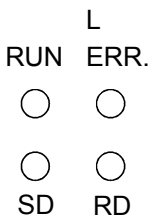
Q80BD-J71LP21G, Q80BD-J71LP21GE:
The sixth digit (from the left) of the serial No. is 4 or higher.
*****[4]*********-*

The serial No. of the board can be verified at the part shown in the illustration.



(1) Indicator LED

Display the operating status of the MELSECNET/H board status.



(a) When the RUN LED is ON or OFF

The same LED display as a network module.

Name	Status	Description
RUN	ON	Operating normally
	OFF	One of the following error has occurred. • Board WDT error (Hardware failure) • Board resetting (The driver is not started.)
L.ERR.	ON	Communication error One of the following error has occurred. Confirm the error with LED status displayed on "Board information" screen of MELSECNET/H utility. CRC: An error has occurred by a fault such as a cable fault and noise. OVER: This error occurs when the next data is received before the last received data is loaded into the module, and the previous data is lost. It is caused by hardware failure in the receive area of the network module. AB.IF: This error occurs when the number of receive bit data indicating "1" in the frame is more than or equal to the specified number of data, or when the receive data is shorter than the specified data length. TIME: This error occurs when a baton pass was not handed to the host station within the monitoring time. DATA: This error occurs when abnormal code data is received. UNDER: This error occurs when the internal processing of the send data was not executed at a fixed interval. LOOP: This error occurs when the forward loop line or reverse loop line is faulty and the power to the adjacent station, which sends data to the host station, is turned off or the hardware of the sending station part in the loop is faulty.
	OFF	Operating normally
SD	ON	Sending data
	OFF	Not sending data
RD	ON	Receiving data
	OFF	Not receiving data

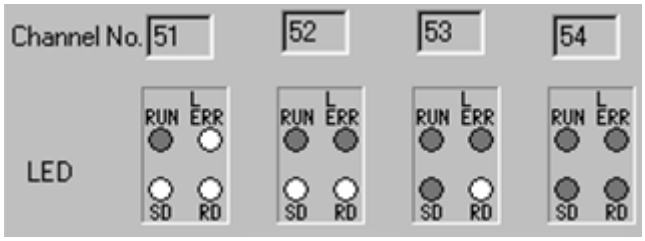
(b) When the RUN LED is flashing

An error which is peculiar to boards has occurred.
Check on the "Event Viewer" screen and take corrective action. (Refer to Section 14.3.2)

Name	Status	Description
RUN	Flashing	One of the following error has occurred. (Check L ERR.LED, SD LED and RD LED.)
L.ERR.	ON	Operating system startup error has occurred.
SD	ON	Driver WDT error has occurred.(Refer to 14.7.2)
RD	ON	PCI bus error has occurred.

(c) When checking channel number

The status is displayed as shown below according to the current channel number while opening the "Channel No. Setting" screen. (Refer to 9.2.2)



(2) External power supply indicator LED

Display the status of external power supply.

EXT.PW
○

Name	Status	Description
EXT.PW	ON	External power supply is being supplied.
	OFF	External power supply is not supplied.

6 - 6

6.3 Installation

This section explains precautions when handling the MELSECNET/H board and the installation environment.

6.3.1 Handling precautions

The following are precautions to be noted when handling the MELSECNET/H board.

⚠WARNING

- While energizing, do not touch the connector.
  Doing so may result in electric shock or cause malfunctioning.

⚠CAUTION

- Do not directly touch the conductive section of the board.
  Doing so could result in malfunctioning or breakdown of the board.
- Before handling the board, touch a grounded metal object to discharge the static electricity from the human body.
  Failure to do so may cause failure or malfunction of the board.
- Handle the board in a location where there is no static electricity.
  Static electricity could result in failure or malfunctioning.
- The board is packed in a bag for preventing static electricity.
  Always place the board in this bag when storing or transporting.
  Otherwise, failure or malfunctioning may result.
- Take care that foreign objects such as chips or wiring debris do not get into the PC.
  This could result in fire, breakdowns or malfunctioning.
- Do not dismantle or rebuild the board.
  This will result in failure, malfunctioning, injury or fire.
- When disposing of the product, handle it as an industrial waste.
- Do not drop the board or subject it to strong impact.
  This will result in failure or malfunctioning of the board.

6.3.2 Installation environment

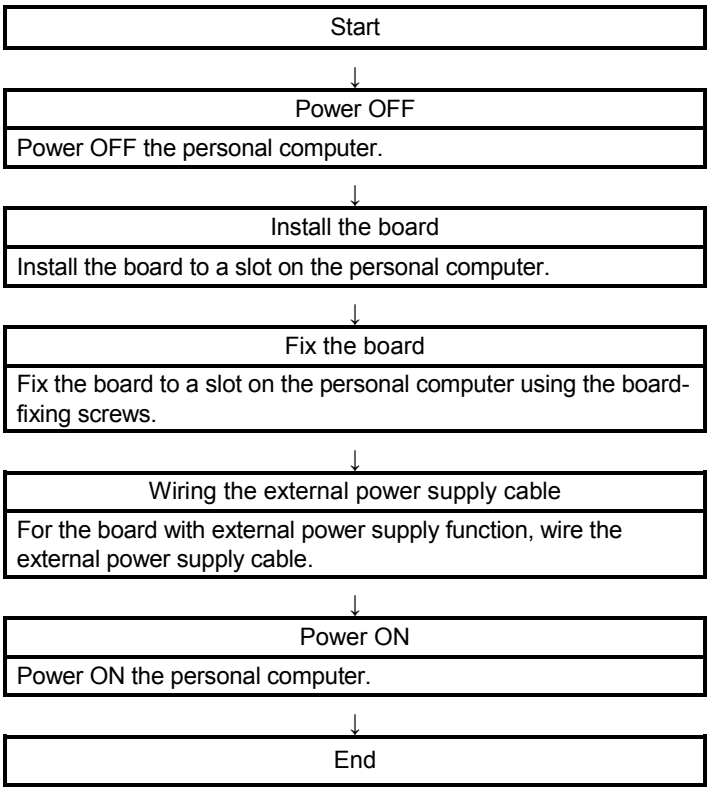
Refer to the instruction manual accompanying the PC module regarding installation of the PC module in which the MELSECNET/H board is mounted.

⚠CAUTION

- Always ground the PC module using grounding type D (Class 3 grounding).
  Otherwise, there is the risk of malfunctioning.

6.3.3 Board installation

The following flowchart shows the board installation procedure.


Start
Power OFF
Power OFF the personal computer.
Install the board
Install the board to a slot on the personal computer.
Fix the board
Fix the board to a slot on the personal computer using the board-fixing screws.
Wiring the external power supply cable
For the board with external power supply function, wire the external power supply cable.
Refer to Section 6.4.4
Power ON
Power ON the personal computer.
End

For the installation method of the board to a slot, refer to the instruction manual provided with the personal computer.

⚠WARNING

- Be sure to shut off all phases of the external power supply used by the system before performing work such as installing the board and wiring.
  If all power is not turned off, there is a risk of electric shock or damage to the product.
- When turning on the power and operating the module after having installed the board and doing the wiring, always attach the cover for the device module in which the board is installed.
  There is a risk of electric shock if the module cover is not attached.

⚠CAUTION

- Fix the board by tighten the board-fixing screws within the specified torque range. Under tightening may cause malfunction, short circuit, or malfunction. Over tightening may damage the screw and/or module, resulting in drop, short circuit, or malfunction. For the tightening torque of the board fixing screws, refer to the manual supplied with the personal computer.
- Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the board.
  Failure to do so may cause a failure or malfunctions of the board.
- Install the board to a personal computer which is compliant with PCI standard or PCI Express® standard (Refer to "Section 2.5 Operating Environment").
  Failure to do so may cause a failure or malfunction.
- Securely mount the board to the PCI slot of the mounting device.
  If the board is not mounted correctly, this may lead to malfunctioning, failure or cause the board to fall.

CAUTION	• When installing the board, take care not to contact with other boards. • When mounting the board, take care not to become injured by the components that are installed or surrounding materials.

6.3.4 Channel No. settings

Channel No. is set to each board in order to discriminate the board. The number can be set within the range of 51 to 54.
Channel No. is used to specify the target board when setting parameter or executing MELSEC data link library function.

(1) Setting method

The following explains the channel No. assignment method of MELSECNET/H board.

(a) Automatic assignment of channel No.

The channel No. is automatically assign to MELSECNET/H boards installed in a personal computer in the order of the PCI slot No., from 51 to 54.
Check your personal computer's manual concerning the order of the PCI slot numbers.

(b) User specified assignment method

In user specified assignment, the user changes the channel No. in the "Channel No. Setting" screen in the "Board List" screen of the MNETH utility. After the change, the set assignment in "Channel No. Setting" becomes valid.

POINT

As MNETH utility products (SW0DNC-MNETH-B) (version 19V or later) store channel numbers assigned to each MELSECNET/H board, these channel numbers will automatically be set when a PCI slot is changed.
Channel numbers will automatically be assigned as follows:
<When using a MELSECNET/H board that has not assigned channel numbers>
- Channel numbers will be assigned in a PCI slot number order.

<When using a MELSECNET/H board that has assigned channel numbers>
- Previously used channel numbers will be assigned.
- If previously used channel numbers are used already, unused channel numbers will be assigned.

As the utility software stores channel numbers corresponding to a MELSECNET/H board, if the utility software is reinstalled, the board will be the status that any channel numbers are not assigned.

6.4 Wiring

This section explains precautions when connecting cables to MELSECNET/H board.

(1) Precautions on general wiring

⚠WARNING

- Be sure to shut off all phases of the external power supply used by the system before performing work such as installing the board and wiring.
  If all power is not turned off, there is a risk of electric shock or damage to the product.
- When turning on the power and operating the module after having installed the board and doing the wiring, always attach the cover for the device module in which the board is installed.
  There is a risk of electric shock if the module cover is not attached.

⚠CAUTION

- When removing the cable from the board, do not pull the cable.
  Pulling the cable that is still connected to the board may cause damage to the board or cable, or malfunction due to bad cable contacts.
- Prevent foreign matter such as chips or wiring debris from getting on the board.
  Failure to do so can result in fire, breakdowns or malfunction.

(2) Precautions on communication cable wiring

⚠CAUTION

- Solder the coaxial cable properly.
  If the soldering is incomplete, it may cause the module malfunction.
- For the communication cable, specialized skills and tools are required to connect the plug and cable. The connector plug itself is a custom part.
  When purchasing, consult your local Mitsubishi representative.
  If the connection is incomplete, this can result in a short, fire or malfunction.
- Be sure to fix communication cables connecting to the board by placing them in the duct or clamping them.
  Cables not placed in the duct or without clamping may be hang freely and accidentally pulled, which may cause damage to the board or cable, or malfunction due to bad cable contacts.

REMARK

Refer to "Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)" for details of each communication cable.

(3) Precautions on external power supply cable wiring

⚠CAUTION	• Verify the rated voltage and pin assignment of the product and connect the external power supply cable properly. Connecting a power supply with a different voltage rating, imperfect cable crimping or faulty wiring may cause a fire or failure. • Use a specified tool for crimping of the cable and contacting pin. Imperfect crimping may cause malfunction. • Verify the pin assignment and fully insert the crimped contacting pin into the connector. Imperfect insertion may cause failure or malfunction. • Insert the wired external power supply cable into the external power supply cable connector until a click is heard. Imperfect insertion may cause failure or malfunction. • Keep the external power supply cable away from the main circuit cable, power cables and/or load cables connected to other than programmable controllers. Ensure a distance of 100mm between them. Failure to do so may result in malfunction due to noise, surge or induction.

6.4.1 Optical loop system

The precautions for connecting the optical fiber cable with Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G and Q80BD-J71LP21GE in an optical loop system are given below.

(1) Precautions for connecting

(a) The types of optical fiber cables that can be used vary depending on the distance between stations.

Type		Distance between stations (m)			
		Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25		Q80BD-J71LP21G 10Mbps (fixed)	Q80BD-J71LP21GE 10Mbps (fixed)
		10Mbps	25Mbps		
SI type optical fiber cable (Old type: A-2P-□)	L type	500 (1640.5 ft.)	200 (656.2 ft.)	Not allowed	Not allowed
	H type	300 (984.3 ft.)	100 (328.1 ft.)		
SI optical fiber cable		500 (1640.5 ft.)	200 (656.2 ft.)		
H-PCF optical fiber cable		1000 (3281 ft.)	400 (1312.4 ft.)		
Broad-band H-PCF optical fiber cable		1000 (3281 ft.)	1000 (3281 ft.)		
QSI optical fiber cable		1000 (3281 ft.)	1000 (3281 ft.)		
GI optical fiber cable		Not allowed	Not allowed	2000 (6562 ft.)	
62.5 GI optical fiber cable				Not allowed	2000 (6562 ft.)

(b) When connecting an optical fiber cable to Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G and Q80BD-J71LP21GE the restrictions on the bending radius should be observed.
For bending radius details, check with the cable to use.

(c) Maintain the bending radius of the optical fiber cable within the allowable range using a tool for securing the optical fiber cable bending radius.
This tool may be purchased from Mitsubishi Electric System Service, Inc, or your nearest dealer. Please inquire for more information.

(d) When laying the optical-fiber cables, do not touch the fiber cores of the cable and module connectors, and do not let dust or particles collect on them.
If oil from hands, dust or particles adhere to the cores, the accumulated transmission loss may cause malfunctions in the data link.
Do not detach the cover until the cable is attached.

(e) When attaching or detaching the optical fiber cable to/from the module, pull or insert the cable by holding the cable connector securely with your hand.

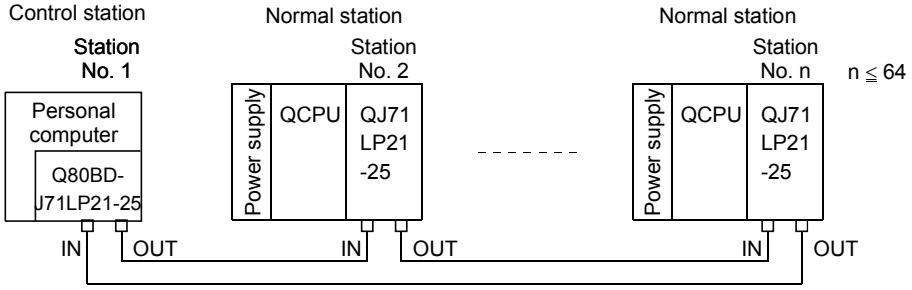
(f) Connect the cable and module connectors securely until you hear a "click" sound.

(g) When attaching or detaching the optical fiber cable to/from the module, make sure to power off the personal computer and external power supply.

(2) Cable connection

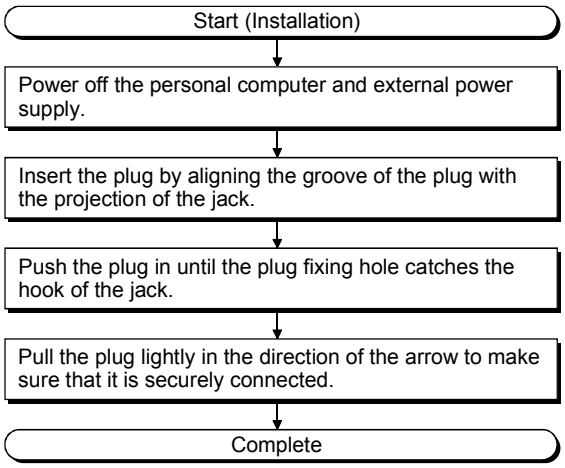
(a) How to connect the cable

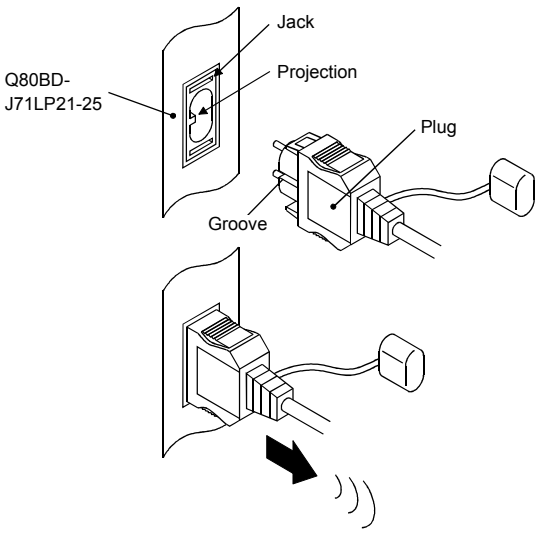
Connect the IN and OUT terminals with optical fiber cables as shown below.
Stations do not have to be connected in the order of station numbers.
Any station number can be assigned as the control station.



(b) Installing the optical fiber cable

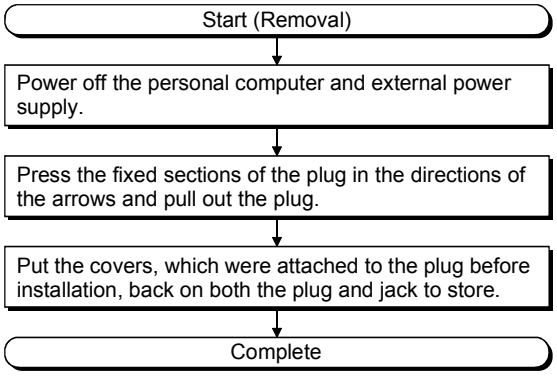
The following shows how to install the optical fiber cable:

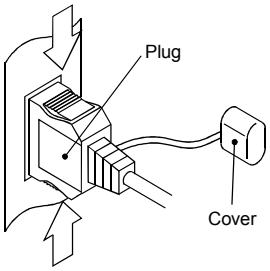

Start (Installation)
Power off the personal computer and external power supply.
Insert the plug by aligning the groove of the plug with the projection of the jack.
Push the plug in until the plug fixing hole catches the hook of the jack.
Pull the plug lightly in the direction of the arrow to make sure that it is securely connected.
Complete



(c) Removing the optical fiber cable

The following shows how to remove the optical fiber cable:


Start (Removal)
Power off the personal computer and external power supply.
Press the fixed sections of the plug in the directions of the arrows and pull out the plug.
Put the covers, which were attached to the plug before installation, back on both the plug and jack to store.
Complete



POINT

Data link operation may be executed even if IN and IN or OUT and OUT are connected with an optical fiber cable. However, the loopback function, the network diagnostic function and some of other functions do not operate normally. So, make sure to connect IN and OUT.

6.4.2 Coaxial bus system

This section explain precautions for connection of the coaxial cable and Q80BD-J71BR11 in the coaxial bus system.

(1) Precautions in connecting

(a) Restrictions on the cable length between the stations

1) When connecting between the network modules, the cable lengths indicated in the table below should be used according to the number of stations connected.
A communication error may occur if a cable length other than the lengths indicated in the table is used.

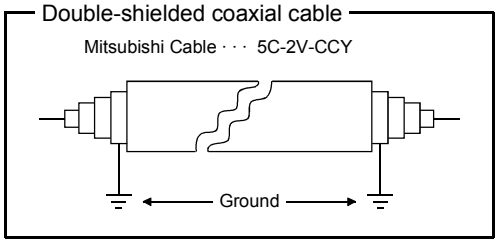
Number of stations connected / Station-to-station cable length	2 to 9 stations			10 to 33 stations		
Cable type	3C – 2V	5C – 2V	5C – FB	3C – 2V	5C – 2V	5C – FB
0 to 1 m (3.28 ft.)	× (cable less than 1m (3.28 in.) in length cannot be used.)					
1 (3.28 ft.) to 5 m (16.4 ft.)	○	○		○	○	
5 (16.4 ft.) to 13 m (42.65 ft.)	○	○		×	×	
13 (42.65 ft.) to 17 m (55.78 ft.)	○	○		○	○	
17 (55.78 ft.) to 25 m (175.63 ft.)	○	○		×	×	
25 (175.63 ft.) to 300 m (984.3 ft.)	○	○		○	○	
300 (984.3 ft.) to 500 m (1640.5 ft.)	×	○		×	○	

○: Allowed ×: Not allowed

2) If there is a possibility of adding more stations to expand the existing system, the cables should be installed by considering restriction 1) mentioned above in advance.
3) When using a repeater module (models A6BR10 or A6BR10-DC), use the station-to-station cable length for "10 to 33" stations, regardless of the number of stations connected or the number of repeater modules.

(b) Cable installation precautions

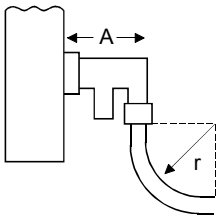
1) Install the coaxial cables at least 100 mm (3.94 in.) away from other power cables and control cables.
2) Consider to use double-shielded coaxial cables in locations where there is excessive noise.



5C-2V connector plug can be applied to double-shielded coaxial cable. Connect the plug to the coaxial cable inside the double-shielded coaxial cable.
Ground the shielded section, external part of the double-shielded coaxial cable, as shown above.

(c) When connecting a coaxial cable, the following restrictions on the bending radius must be observed.

Cable type	Allowable bending radius r [mm (in.)]	Connector A (mm (in.))
3C – 2V	23 (0.91)	55 (2.17)
5C – 2V	30 (1.18)	
5C – FB		



(d) Do not pull any of the connected coaxial cables.
This may cause a faulty contact and cable disconnection, or damage the Q80BD-J71BR11.

(e) In the coaxial bus type network system be sure to connect terminal resistors in both end terminals in the network.

(f) There is a possibility that of a white oxidation product forming on the type F connector due to the use environment, but it does not occur on the portions that are fitted together, so functionally, there will be no problem.

(g) When attaching or detaching the coaxial cable to/from the module, make sure to power off the personal computer.

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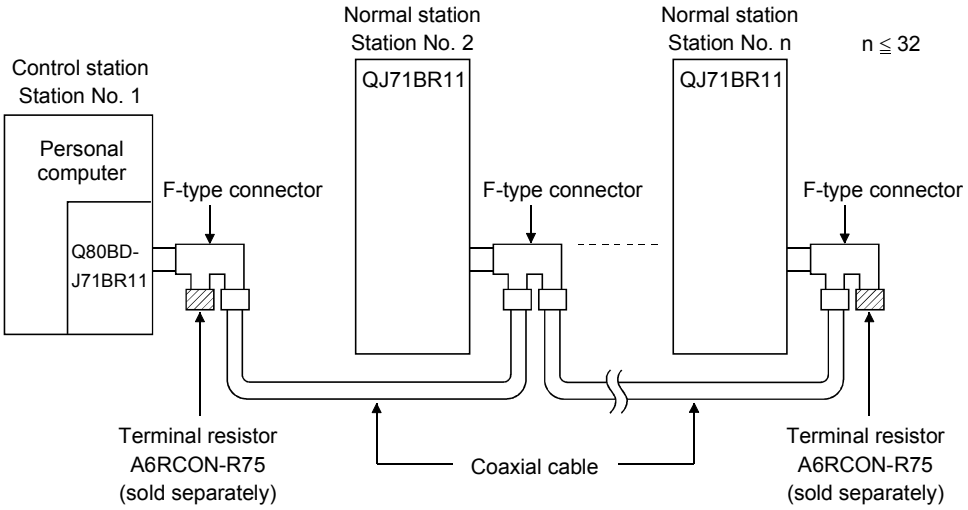
(2) Cable connection

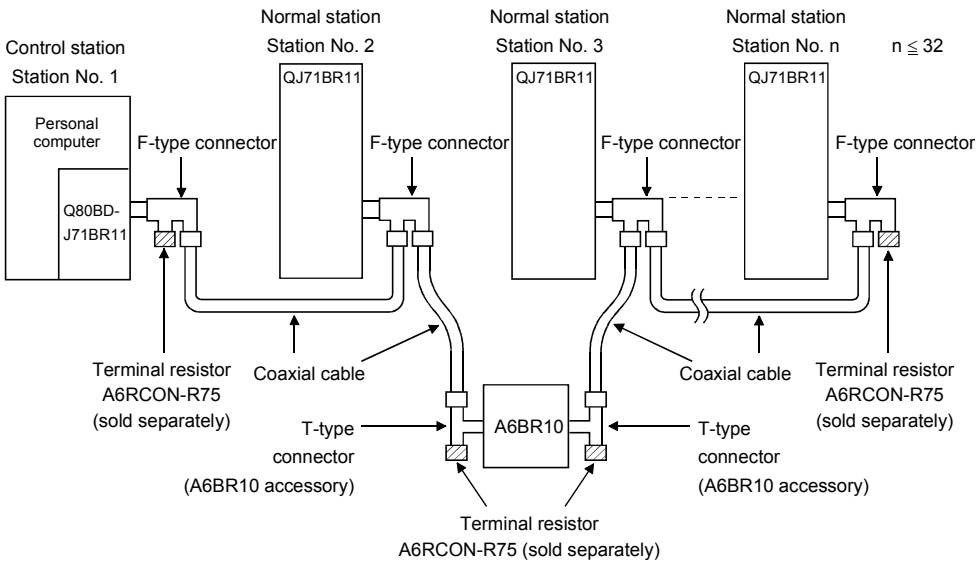
(a) Connection method

Connect the coaxial cable as shown below.
Always install a terminal resistor (sold separately: A6RCON-R75) to the stations connected at both ends.
The F-type connector comes with the Q80BD-J71BR11.

1) Without a repeater module



2) With a repeater module (series connection)

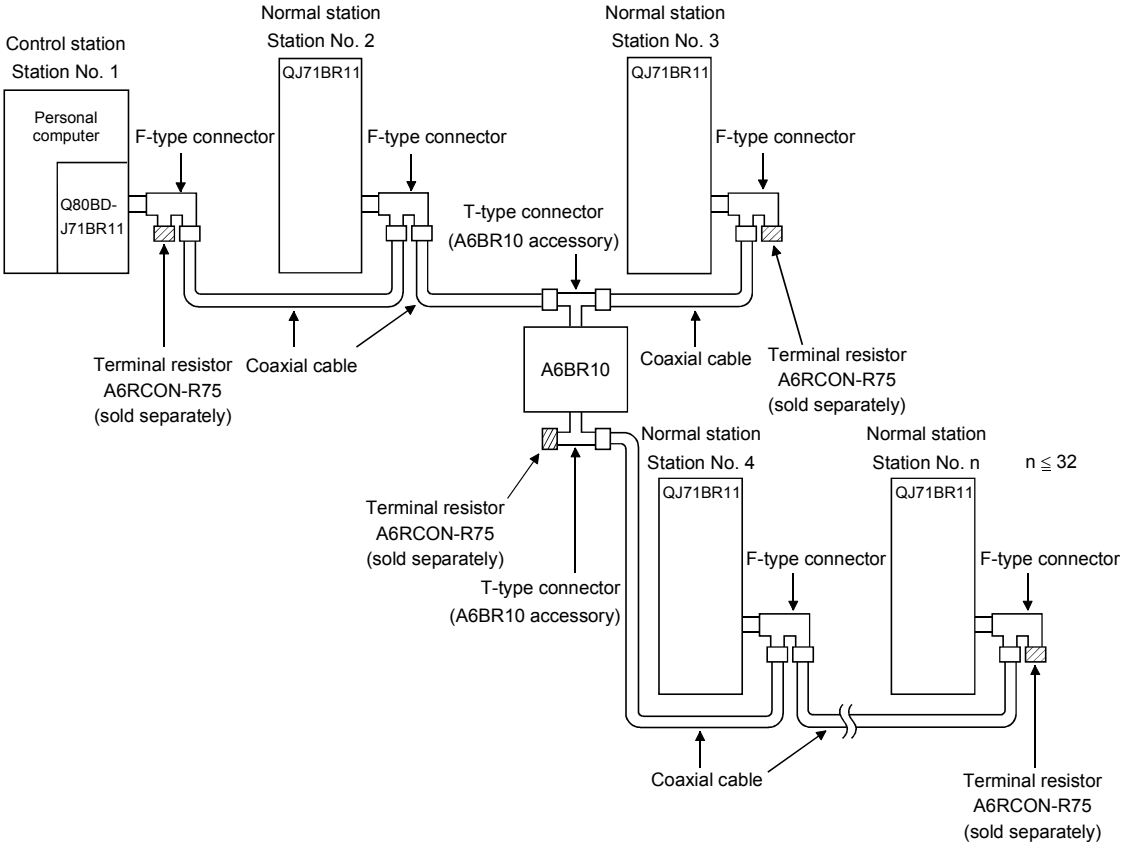


REMARK

For details about the repeater module (A6BR10), refer to the following user's manual attached to the product:

Model A6BR10/A6BR10-DC MELSECNET/10 Coaxial Bus System Repeater Module User's Manual (IB-66499)

3) With a repeater module (branch connection)

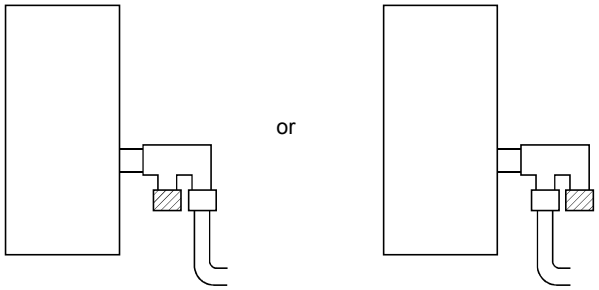


POINT

(1) By setting stations that will be connected in future (stations that are included in the number of stations but not actually connected) as reserved stations, a communication error can be prevented and the link scan time will not be affected.

(2) The two connectors of the F-type connector are not dedicated to IN and OUT. A coaxial cable can be connected to either of them.

(3) A terminal resistor can be placed on either side of the F-type connector.



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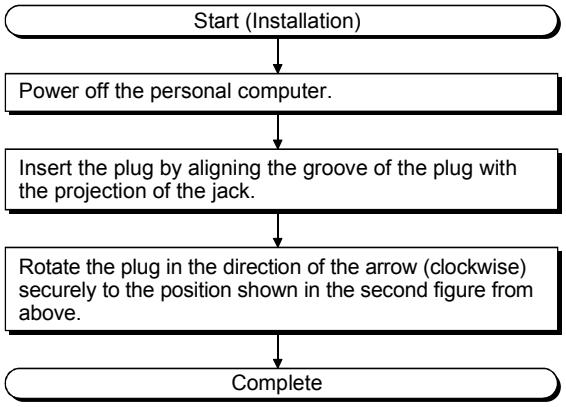
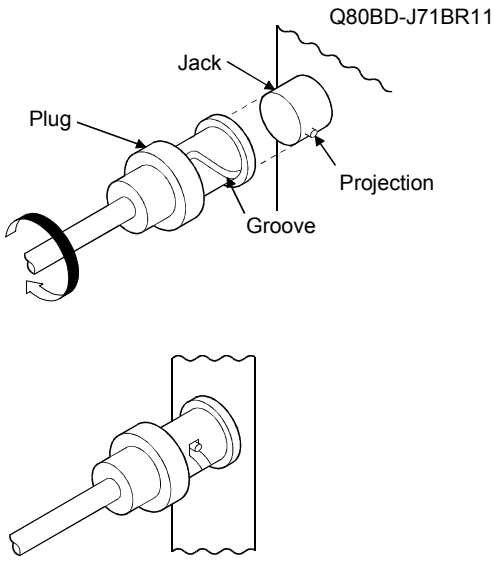
(b) Installing the coaxial cable

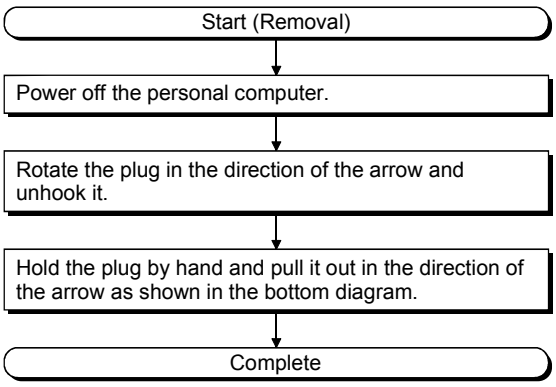
The following shows how to install the coaxial cable:

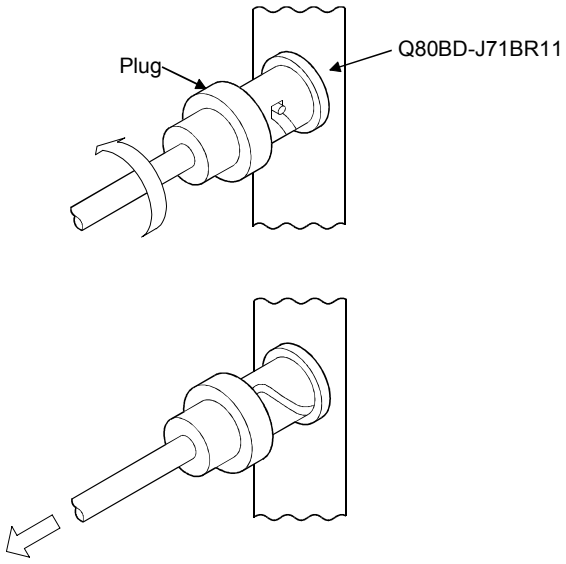

Start (Installation)
Power off the personal computer.
Insert the plug by aligning the groove of the plug with the projection of the jack.
Rotate the plug in the direction of the arrow (clockwise) securely to the position shown in the second figure from above.
Complete



(c) Removing the coaxial cable

The following shows how to remove the coaxial cable:


Start (Removal)
Power off the personal computer.
Rotate the plug in the direction of the arrow and unhook it.
Hold the plug by hand and pull it out in the direction of the arrow as shown in the bottom diagram.
Complete



(d) Terminal reisistor

Coaxial bus system needs the terminal resistor at the both ends of the network.

The user need to arrange the terminal resistor (A6RCON-R75) as it is not included in Q80BD-J71BR11.

6.4.3 Connecting the connector for the coaxial cable

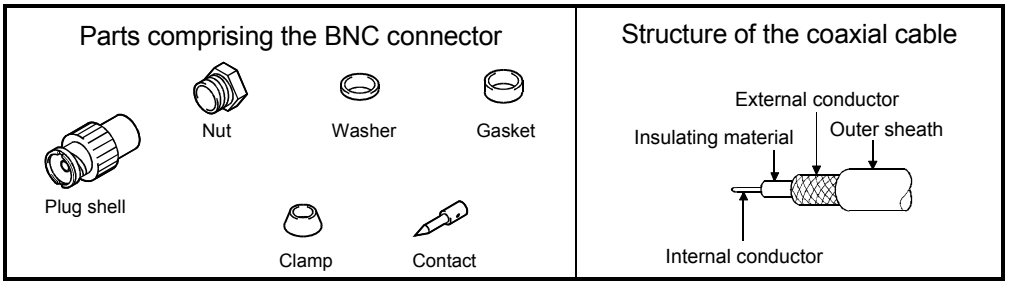
The following section explains how to attach the BNC connector (connector plug for the coaxial cable) to the cable.

(1) Using a BNC connector manufactured by DDK Ltd.

The following explains how to connect the BNC-P-3-NiCAu or BNC-P-5-NiCAu to the cable.

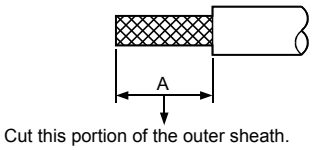
CAUTION
- Correctly solder coaxial cable connectors. Incorrect soldering may result in malfunction.

(a) Structure of the BNC connector and coaxial cable



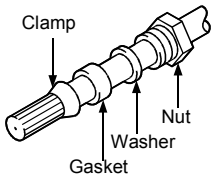
(b) How to attach the BNC connector and the coaxial cable

1) Cut the portion of the outer sheath of the coaxial cable as shown in the figure below.

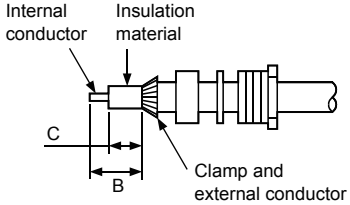


Cable	A
3C-2V	15mm (0.59 in.)
5C-2V, 5C-2V-CCY	10mm (0.39 in.)

2) Fit the nut, washer, gasket, and clamp onto the coaxial cable, as shown below, and then loosen the external conductor.

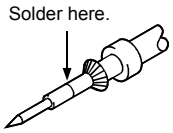


3) Cut the external conductor, insulation material and internal conductor to the dimensions shown below. However, cut the external conductor to the same dimension as the tapered section of the clamp and smooth it down to the clamp.

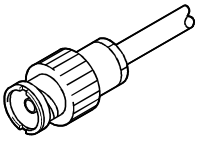


Cable	B	C
3C-2V	6mm (0.24 in.)	3mm (0.12 in.)
5C-2V, 5C-2V-CCY	7mm (0.28 in.)	5mm (0.20 in.)

4) Solder the contact to the internal conductor.



5) Insert the connector assembly in 4) into the plug shell and screw the nut into the plug shell.



POINT

(1) Note the following precautions when soldering the internal conductor and contact.
- Make sure that the solder does not bead up at the soldered section.
- Make sure there are no gaps between the connector and cable insulator or they do not cut into each other.
- Perform soldering quickly so the insulation material does not become deformed.

(2) Before connecting or disconnecting the coaxial connector, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may result in a MELSECNET/H board malfunction.

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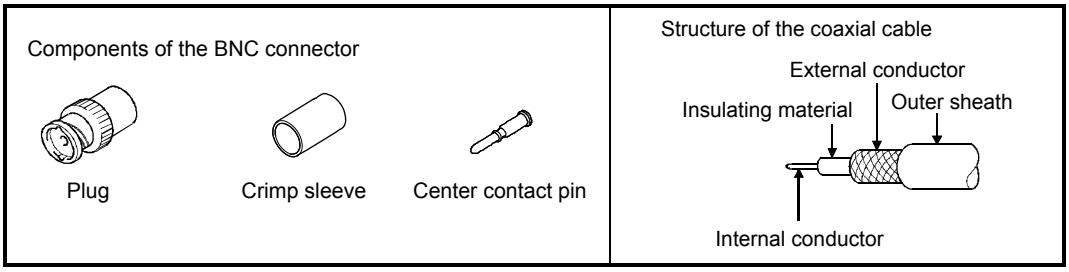
(2) Using a BNC connector manufactured by Canare Electric Co., Ltd.

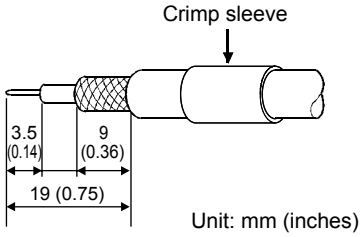
The following explains how to connect the BCP-C3B, BCP-C5B, or BCP-C5FA to the cable.

(a) Structure of the BNC connector and coaxial cable

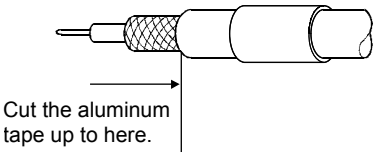


(b) How to connect the BNC connector and the coaxial cable

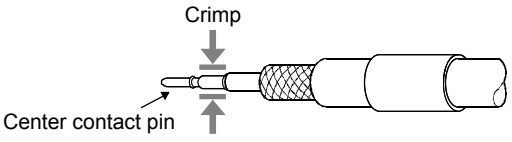
1) Thread a coaxial cable through a crimping sleeve as shown in the figure below.
When using a cable with aluminum tape, cut the tape as shown in the figure below.



When cutting the tape, make a clean cut, without leaving any stray pieces or loose strands. Failure to do so may cause a short circuit or result in an improper crimp.



2) Insert a center contact pin into the internal conductor. Crimp the pin using a crimp tool to seal the gap between the center contact pin and the insulating material.



POINT

(1) Use a crimp tool specified for a BNC connector.
(2) Do not crimp the junction of the insulating material and the center contact pin.
(3) Horizontally insert the center contact pin into the insulating material and crimp the pin. If the pin is on the tilt, straight it.

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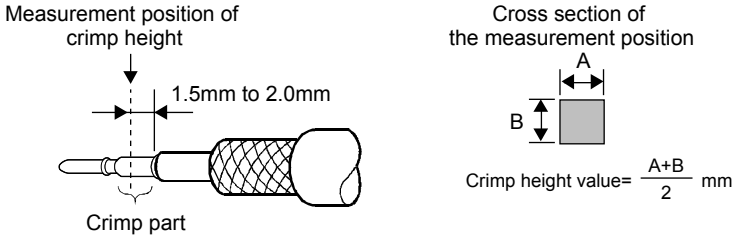
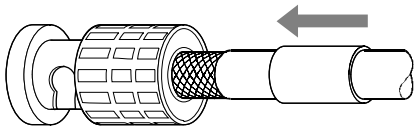
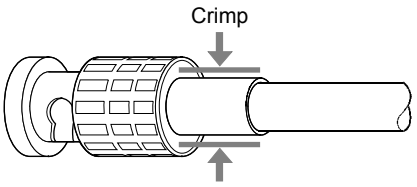
3) After the crimp, check the crimp height of the crimp part. When the crimp height at the measurement position is between 1.4mm and 1.5mm, the pin is properly crimped.
If the crimp height is not between 1.4mm and 1.5mm, adjust the crimp tool and crimp the center contact pin again.



4) Hold the root of the coaxial cable and fully insert the cable into a plug. After inserting the cable, pull it lightly to check that the center contact pin is fixed.
Move the crimp sleeve until it contacts with the plug.



5) Crimp the crimp sleeve using the crimp tool with attention paid to the orientations of the crimp tool and connector.
Do not pull the cable when crimping the sleeve.



POINT
Before connecting or disconnecting the coaxial connector, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may result in a MELSECNET/H board malfunction.

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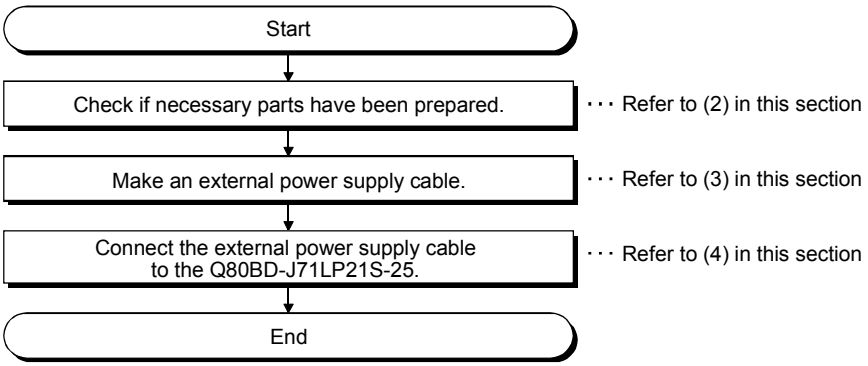
6.4.4 External power supply cable wiring

This section explains how to connect the external power supply cable to the Q80BD-J71LP21S-25.

(1) Connection steps

Connect the external power supply cable to the Q80BD-J71LP21S-25 in the following steps:


Start
Check if necessary parts have been prepared.
··· Refer to (2) in this section
Make an external power supply cable.
··· Refer to (3) in this section
Connect the external power supply cable to the Q80BD-J71LP21S-25.
··· Refer to (4) in this section
End

(2) Parts and tool required for making an external power supply cable

To make an external power supply cable, the following parts and a tool are required.

(a) Connector set (Accessory)

Check that the following parts are contained in the connector set supplied with the product.

Parts	Model	Applicable cable size	Quantity
Connector	1-178288-3	—	1
Contacting pin	175218-2	AWG#20-16	3 (1 spare)

(b) Cable

Use an external power supply cable with heat-resistant vinyl sheath of 0.50 to 1.25mm^2 [AWG#20-16].

(c) Tool

Be sure to use the following specified tool.

Model	Applicable cable size	Inquiry
91558-1	AWG#20-16	Tyco Electronics

(3) Making external power supply cable

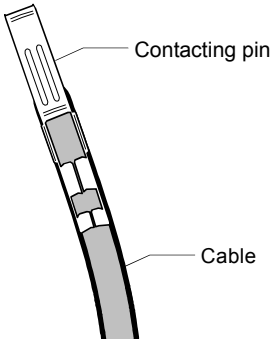
Make an external power supply cable as follows:

(a) Crimping to the contacting pin

Using a crimping tool, crimp the cable and contacting pin.
Set the contacting pin and cable in the grooves of the crimping tool and squeeze the handle tightly.
For details, refer to the instructions of the crimping tool.

(b) Check the crimped condition

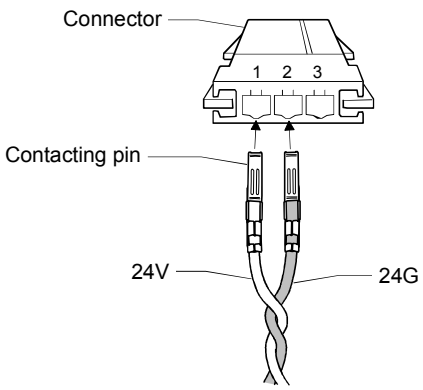
Check if the cable (including a part of the sheath) is evenly crimped to the contacting pin.
If only wire part is crimped and not the sheath part, or if the cable is stuck out, the cable can be cut off or malfunction may occur.



(c) Connecting to the connector

According to the following pin assignment, fully insert the crimped cable to the connector until a click is heard.

Pin No.	Description
1	24V
2	24G
3	Open



(4) Connecting external power supply cable to board

Properly insert the completed external power supply cable to the external power supply cable connector of the Q80BD-J71LP21S-25 until a click is heard.
Keep the external power supply cable away from the main circuit cable, power cables and/or load cables connected to other than programmable controllers. (Ensure a distance of 100mm (3.94 in.) between them.)

POINT
Be sure to twist the external power supply cable.

6.5 Test

Before executing the data link operation, check the MELSECNET/H board and the cables.
Select a test item using the mode setting switch on the "Board information" screen in the MNETH Utility.
The MELSECNET/H board test has the following five types.

Item	Test type	Description	Reference
Board confirmation	Self-loopback test	This test checks the hardware of the internal circuits, including the send/receive circuit of the MELSECNET/H board, as well as the cables.	Section 6.5.1
	Internal self-loopback test	This test checks the hardware of the internal circuits, including the send/receive circuit of the MELSECNET/H board.	Section 6.5.2
	Hardware test	This test checks the hardware inside the MELSECNET/H board.	Section 6.5.3
Network confirmation	Test between master station Test between slave station	This test checks the hardware of the MELSECNET/H board, network modules and cables between two adjacent stations can be checked.	Section 6.5.4
	Forward loop test Reverse loop test	This test checks the Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE network module and cable hardware after all the stations have been connected with optical fiber cable, and can also check if the IN and OUT cables have been connected correctly.	Section 6.5.5

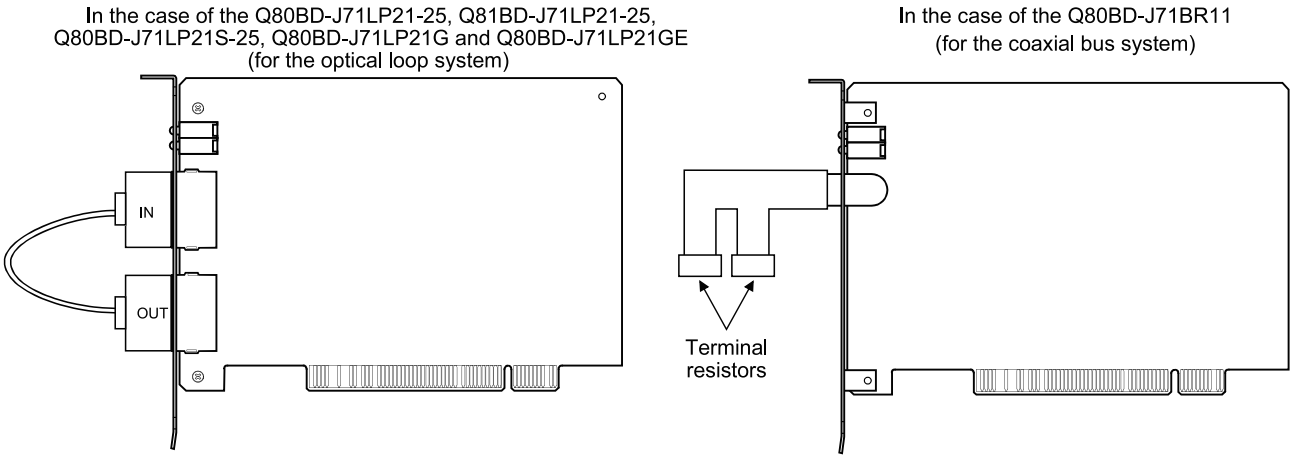
REMARK

The test modes are equivalent to offline. The data link cannot be executed if one station is set to the test mode during data link. Set the mode to "Online (auto. reconnection)" when performing data link.

6.5.1 Self-loopback test

In this section, a check of the hardware, including the MELSECNET/H board itself, the transmission and reception lines in the transmission system and the cable, is conducted.

(1) Connect optical fiber cables to the IN and OUT connectors of the Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G and Q80BD-J71LP21GE.
In the case of the Q80BD-J71BR11 (for the coaxial bus system), connect terminal resistors to the two Type F connectors.


In the case of the Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G and Q80BD-J71LP21GE (for the optical loop system)
IN
OUT
In the case of the Q80BD-J71BR11 (for the coaxial bus system)
Terminal resistors

(2) Set the mode setting in the "Board Information" screen of the MNETH Utility on "Self-loopback test. "

(3) Click the Board Set button in the "Board Information" screen of the MNETH utility to run the self-loopback test, checking the LED status in the "Board Information" screen to confirm the execution state.
T. PASS blinks during the test.
If T. PASS blinks 20 times and ERROR LED does not blink, the test is completed normally.
Also, if the test ends abnormally, the ERROR LED will blink as shown below to indicate the relevant error information.

(a) Optical Loop System
(Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE)

1) "TIME" LED lights up
- The forward loop cable is broken.
- The forward loop's transmission side and reception side cables are not connected.

2) "DATA" LED lights up
- The reverse loop cable is broken.
- The reverse loop's transmission side and reception side cables are not connected.

3) The "CRC", "OVER" and "AB.IF" LEDs light up on the F.LOOP and R.LOOP sides
- The cable is defective.

4) "UNDER" LED lights up
- Hardware error.
- The cable was disconnected during the test.
- The cable was broken during the test.

(b) Coaxial Bus System (Q80BD-J71BR11)

1) "TIME" LED lights up
- The connector is disconnected.

2) The "CRC", "OVER" and "AB.IF" LEDs light up on the F.LOOP and R.LOOP sides
- The connector is defective.

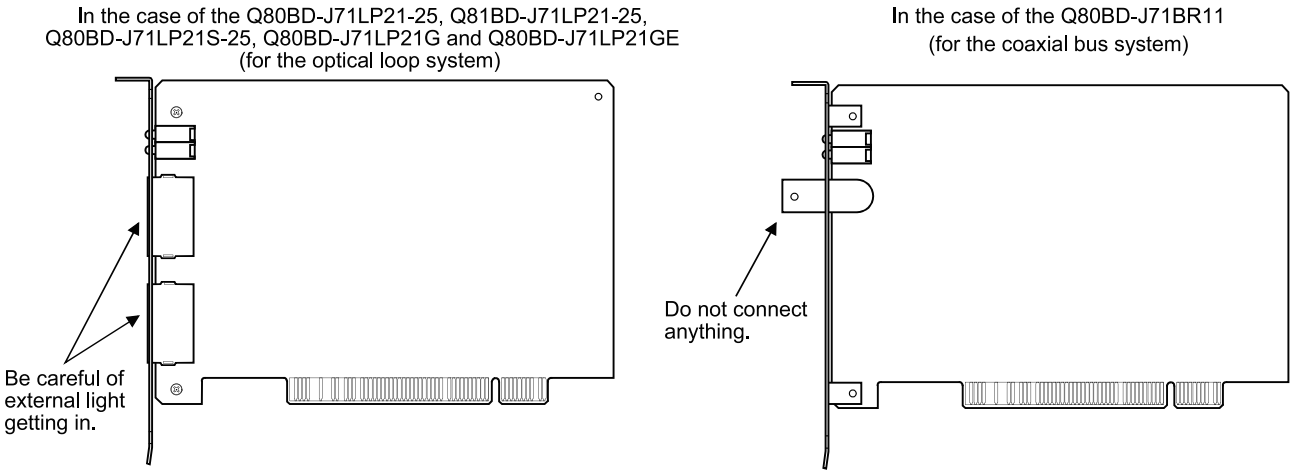
3) "DATA" and "UNDER" LED lights up
- Hardware error.
- The connector was disconnected during the test.

(4) Corrective action when the test completes abnormally
Check if the cable failure is not occurred, the connector is not disconnected, and the wiring is appropriate. If there is any error, correct the connection.
When the cable has been disconnected, replace the cable.
When the hardware error has occurred, replace the board.

6.5.2 Internal self-loopback test

In this section, a check of the hardware, including the transmission and reception lines in the transmission on the MELSECNET/H board itself, is conducted.

(1) Optical fiber cables are not connected to the Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G and Q80BD-J71LP21GE (for the optical loop system). However, be careful that no external light enters from outside the connectors.
In the case of the Q80BD-J71BR11 (for the coaxial bus system), do not connect terminal resistors to the two Type F connectors.


In the case of the Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G and Q80BD-J71LP21GE (for the optical loop system)
In the case of the Q80BD-J71BR11 (for the coaxial bus system)
Be careful of external light getting in.
Do not connect anything.

(2) Set the mode setting in the "Board Information" screen of the MNETH utility on "Internal self-loopback test."

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(3) Click the Board Set button in the "Board Information screen of the MNETH utility to run the Internal self-loopback test, checking the LED status in the "Board Information" screen to confirm the execution state.
T. PASS blinks during the test.
If T. PASS blinks 20 times and ERROR LED does not blink, the test is completed normally.
Also, if the test ends abnormally, the ERROR LED will blink as shown below to indicate the relevant error information.

(a) Optical Loop System
(Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE)

1) The "CRC", "OVER", "AB.IF", "TIME", "DATA" and "UNDER" LEDs light up.
- Hardware error.

(b) Coaxial Bus System (Q80BD-J71BR11)

2) The "CRC", "OVER", "AB.IF", "TIME", "DATA" and "UNDER" LEDs light up.
- Hardware error.

(4) Corrective action when the test completes abnormally
Replace the MELSECNET/H board.

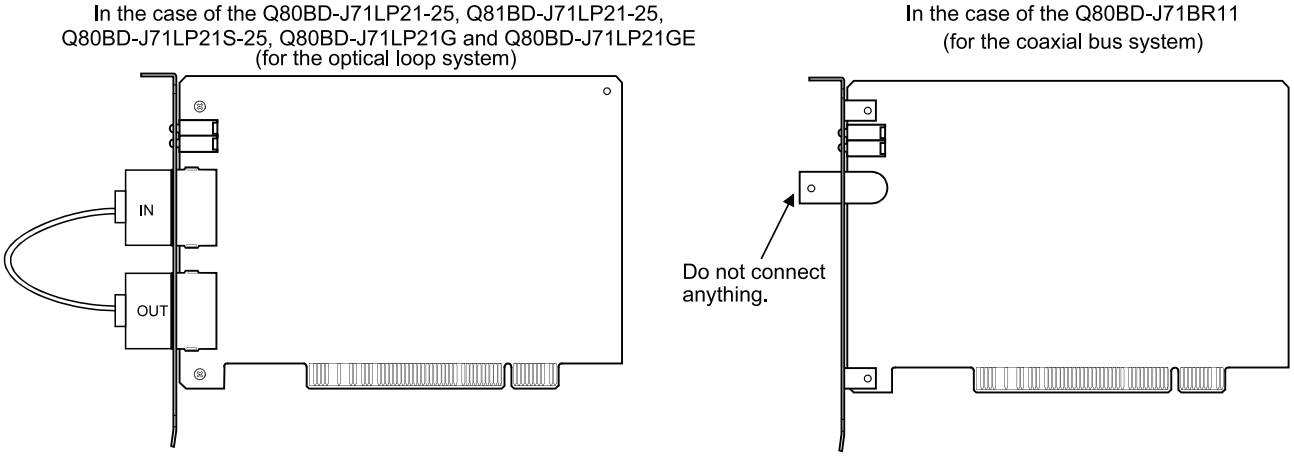
REMARK

If an error occurs in the coaxial bus system, the "M/S.E" LED or "PRM.E" LED may light up besides the "CRC", "OVER", "AB.IF", "TIME", "DATA" and "UNDER" LEDs lighting up.
When requesting repairs of the MELSECNET/H board, be sure to inform the service technician of the LED lighting state.

6.5.3 H/W test

This test checks the internal hardware on the MELSECNET/H board.

(1) Connect the optical fiber cables to the IN and OUT sides of the Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G and Q80BD-J71LP21GE (for the optical loop system).
In the case of the Q80BD-J71BR11 (for the coaxial bus system), do not connect a Type F connector or any terminal resistors.


In the case of the Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G and Q80BD-J71LP21GE (for the optical loop system)
IN
OUT
In the case of the Q80BD-J71BR11 (for the coaxial bus system)
Do not connect anything.

(2) Set the "H/W test" in the mode settings in the "Board Information" screen of the MNETH utility.

(3) Click the Board Set button in the "Board Information" screen in the MNETH utility to run the H/W test, and check the execution state by the status of the LED's in the "Board Information" screen.
T. PASS blinks during the test.
If T. PASS blinks 20 times and ERROR LED does not blink, the test is completed normally.
Also, if the test ends abnormally, the ERROR LED will blink as shown below to indicate the relevant error information.

(a) Both the optical loop system (Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE) and the coaxial bus system (Q80BD-J71BR11) in common
If the following LED's light up, it means that the corresponding error has occurred, so replace the MELSECNET/H board.
1. "CRC" LED lights up ·····ROM Check Error
2. "OVER" LED lights up ·····RAM Check Error
3. "AB.IF" LED lights up ·····Timer, interrupt function check error

(b) Optical loop system (Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE) only
1. "TIME" LED lights up ·····Forward loop broken line check error
2. "DATA" LED lights up ·····Reverse loop broken line check error

(4) Corrective action when the test completes abnormally
Replace the MELSECNET/H board

6.5.4 Station to station test

In the station to station test, the hardware of the MELSECNET/H board, network modules and cables between two adjacent stations can be checked.
The following explains how to conduct the station to station test:

REMARK

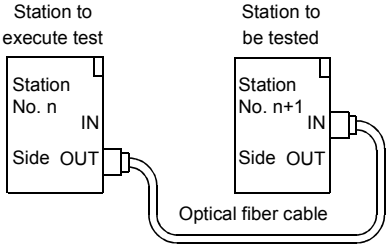
This section explains concerning the MELSECNET/H board.
Refer to the following manuals concerning network module settings.

- Q corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)
- QnA/Q4AR Corresponding MELSECNET/10 Network System Reference Manual

(1) Connecting the cable

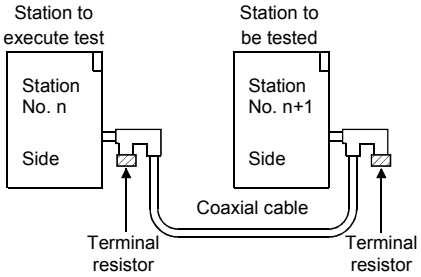
(a) Optical loop system

Connect IN and OUT of network modules, Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G or Q80BD-J71LP21GE with an optical fiber cable.



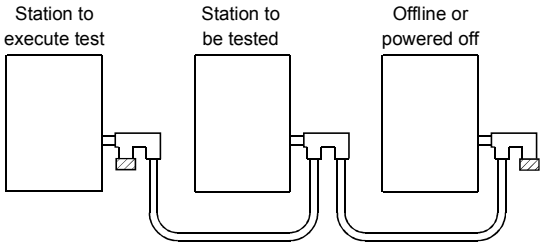
(b) Coaxial bus system

Connect network modules or Q80BD-J71BR11 with a coaxial cable.



REMARK

Before conducting the station to station test when three or more stations are connected by the coaxial bus system, any stations that are not tested should be switched to offline or powered off.



(2) Test mode settings

In the mode settings in the MNETH utility's "Board Information" screen, set the Station No. n, Station No. n + 1 stations' respective "Test between master station" and "Test between slave station" settings.

(3) Start of inter-station test

Set the mode setting on "Test between master station" or "Test between slave station" and click the Board Set button.

This operation is performed in the order of control station → normal station.

(4) Click the Board Set button in the "Board Information" screen of the MNETH utility to run the station to station test, checking the LED status in the "Board Information" screen to confirm the execution state.
If T. PASS blinks 20 times and ERROR LED does not blink, the test is completed normally.
Also, if the test ends abnormally, the following ERROR LED or L. ERR. LED will blink as shown below to indicate the relevant error information.

(a) Optical Loop System
(Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE)

1) "TIME" LED lights up
- The forward loop cable is broken.
- The forward loop's transmission side and reception side cables are not connected.

2) "DATA" LED lights up
- The reverse loop cable is broken.
- The reverse loop's transmission side and reception side cables are not connected.

3) The "CRC", "OVER" and "AB.IF" LEDs light up on the F.LOOP and R.LOOP sides
- The cable is defective.

4) "UNDER" LED lights up
- Hardware error.
- The cable was disconnected during the test.
- The cable was broken during the test.

(b) Coaxial Bus System (Q80BD-J71BR11)

1) "TIME" LED lights up
- The connector is disconnected.

2) The "CRC", "OVER" and "AB.IF" LEDs light up on the F.LOOP and R.LOOP sides
- The connector is defective.

3) "DATA" and "UNDER" LED lights up
- Hardware error.
- The connector was disconnected during the test.

(5) Corrective action when the test completes abnormally
Check if the cable failure is not occurred, the connector is not disconnected, and the wiring is appropriate. If there is any error, correct the connection.
When the cable has been disconnected, replace the cable.
When the hardware error has occurred, replace the board.
For the error occurred in the other station, check the other station.

6.5.5 Forward loop/Reverse loop test

Using the forward loop / reverse loop test you can check the Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE network module and cable hardware after all the stations have been connected with optical fiber cable, and can also check if the IN and OUT cables have been connected correctly.

POINT

The forward loop/reverse loop test can be used only when the Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G or Q80BD-J71LP21GE is used as the control station. If it is a normal station, carry out the test from the control station of the network where the normal station is connected.

REMARK

This section explains concerning the MELSECNET/H board.
Refer to the following manuals concerning network module settings.

- Q corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)
- QnA/Q4AR Corresponding MELSECNET/10 Network System Reference Manual

(1) Test mode settings

If you are performing the forward loop test, set the station executing the forward loop test on "Forward loop test" in the mode settings in the "Board Information" screen of the MNETH utility.
Also, for stations other than the station where the test is being run, treat them as Online.
If you are performing the reverse loop test, set the station executing the forward loop test on "Reverse loop test" in the mode settings in the "Board Information" screen of the MNETH utility.

(2) Start of the test

Set the mode setting on "Forward loop test," "Reverse loop test" or "Online", then click the Board Set button.

This operation is performed in the order of control station → normal station.

(3) Checking the test results

Click the [Board Set] button in the "Board Information" screen in the MNETH utility to run the forward loop/reverse loop test, and check the execution state by the status of the LED's in the "Board Information" screen.
If T. PASS blinks 20 times and ERROR LED does not blink, the test is completed normally.
Also, if the test ends abnormally, the ERROR LED or the L.ERR.LED will blink as shown below to indicate the relevant error information.

1) The "TIME," "DATA" and "UNDER" LED's blink on the F.LOOP and R.LOOP sides.
   • The cable or the other station is abnormal and loop back occurred.
2) The "CRC", "OVER" and "AB.IF" LED's blink on the F.LOOP and R.LOOP sides.
   • The cable is defective.
3) The "TIME" and "DATA" LED's blink on the F.LOOP and R.LOOP sides.
   • The wiring is wrong.
   Check and correct the cable connections before and after the station where the error occurred.

(4) Corrective action when the test completes abnormally

Check if the cable failure is not occurred, the connector is not disconnected, and the wiring is appropriate. If there is any error, correct the connection.
When the cable has been disconnected, replace the cable.
For the error occurred in the other station, check the other station.

MEMO

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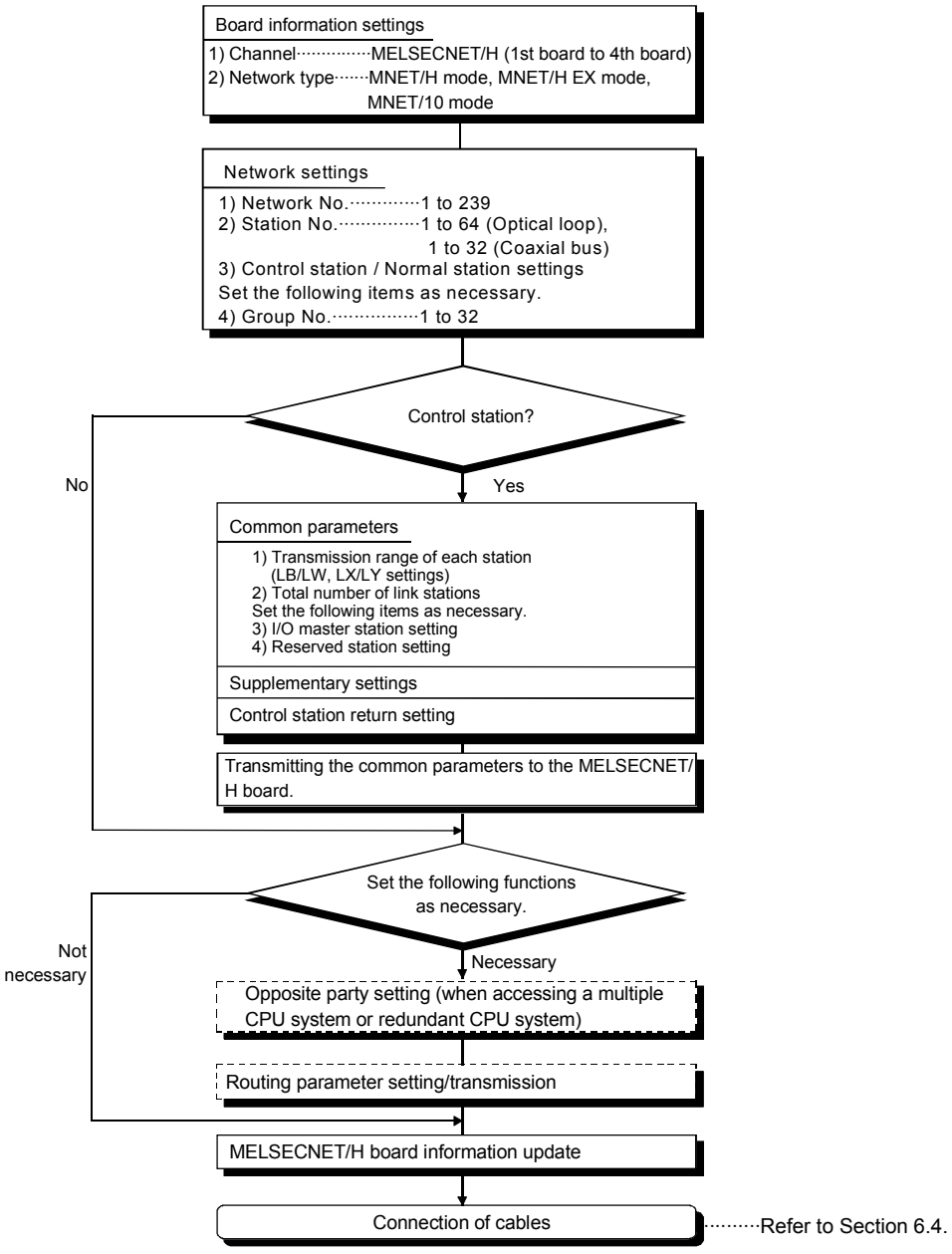
7 PARAMETER SETTINGS

It is necessary to set the MELSECNET/H board's parameters using the MNETH utility in order to operate the MELSECNET/H.
In setting of the parameters, after the MELSECNET/H is selected, it can be set even to the details of the application functions.
A flow chart of the settings is shown below.


Board information settings
1) Channel·····MELSECNET/H (1st board to 4th board)
2) Network type·····MNET/H mode, MNET/H EX mode, MNET/10 mode
Network settings
1) Network No.·····1 to 239
2) Station No.·····1 to 64 (Optical loop), 1 to 32 (Coaxial bus)
3) Control station / Normal station settings
Set the following items as necessary.
4) Group No.·····1 to 32
Control station?
No
Yes
Common parameters
1) Transmission range of each station (LB/LW, LX/LY settings)
2) Total number of link stations
Set the following items as necessary.
3) I/O master station setting
4) Reserved station setting
Supplementary settings
Control station return setting
Transmitting the common parameters to the MELSECNET/H board.
Set the following functions as necessary.
Not necessary
Necessary
Opposite party setting (when accessing a multiple CPU system or redundant CPU system)
Routing parameter setting/transmission
MELSECNET/H board information update
Connection of cables
·····Refer to Section 6.4.

POINT

When replacing a board, you may need the channel numbers and parameter settings that were used before the replacement. When reinstalling the software package, you need to reset the channel numbers and the parameter settings. Be sure to record channel numbers and parameter settings when you have set parameters.

REMARK

Data links can be executed even if the parameters are not set.
In that case, the MELSECNET/H board operates with the default state displayed in the "Board Information" screen for the channel, network type, network No., station No., control station/normal station settings and group No.
When the network type of the control station is the MELSECNET/H Extended mode, the following condition occurs in a normal station with no parameters set.

In the case of a programmable controller: LINK PARA ERROR occurs.
In the case of a MELSECNET/H board: "L.ERR." LED lights up.

In such a case, set parameters to the normal station.

7.1 Board Information Settings

This sets the channel and network type for the MELSECNET/H board that is being used. Perform the settings in the "Board Information" screen of the MNETH utility.

(1) Channel

Select the MELSECNET/H board for which settings are performed in the MNETH utility.
A maximum of 4 MELSECNET/H boards can be installed in one personal computer. The channels that are assigned to each MELSECNET/H board can be checked by clicking the Channel No. Confirm button in the "Board List" screen.

(2) Network type

The settings in the mode for the network system where the MELSECNET/H board is connected can be changed.

Item	Corresponding network
MNET/H mode, MNET/H EX mode	MELSECNET/H
MNET/10 mode	MELSECNET/10

(3) Precautions

(a) Set an identical network type for stations within the same network.
If any different network type is included, the system does not operate normally.

(b) For the MELSECNET/H Extended mode, use the MELSECNET/H board of ROM version 2X or later and the SW0DNC-MNETH-B of version 11M or later. When a MELSECNET/H board incompatible with the MELSECNET/H Extended mode is used, the system does not operate normally.

(c) When connecting a QnA or A series MELSECNET/10 network module, use it in the MELSECNET/10 mode.
If used in any other mode, the system does not operate normally.

(d) Set a transmission speed matched with that of the network.
When an incorrect transmission speed is set, the system does not operate normally.

7.2 Network Settings

These are the parameters used to build the MELSECNET/H network.
The MELSECNET/H board's network No., station No., control station/normal station setting and group No. are set.

7.2.1 Network No.

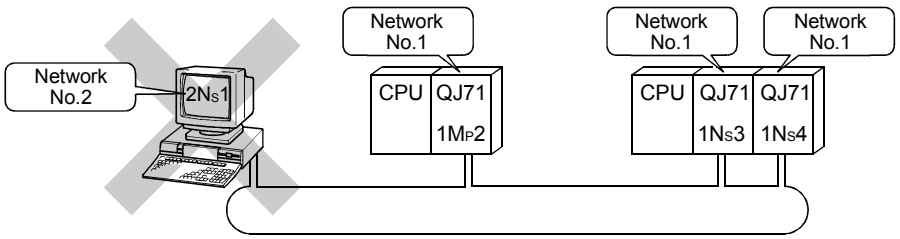
Set the Network No. of the network which the MELSECNET/H board is connected to.
To set the network No, set it in the "Board Information" screen in the MNETH utility.

(1) Valid setting range

1 to 239

(2) Caution

(a) Set the same network No. to all of the devices connected to the same network.



7.2.2 Station No.

Set the station No. of the MELSECNET/H board.
Set the station No. in the "Board Information" screen of the MNETH utility.

(1) Effective setting range

The effective setting range differs depending on the type of network.
- Optical loop system·····1 to 64
- Coaxial bus system·····1 to 32

(2) Caution

(a) Make settings so that the same station No. does not exist in more than one place in the same network.

7.2.3 Control station/Normal station

Set the Control station / Normal station setting on the MELSECNET/H board.
Set the Control station / Normal station setting in the "Board Information" screen of the MNETH utility.

7.2.4 Group No.

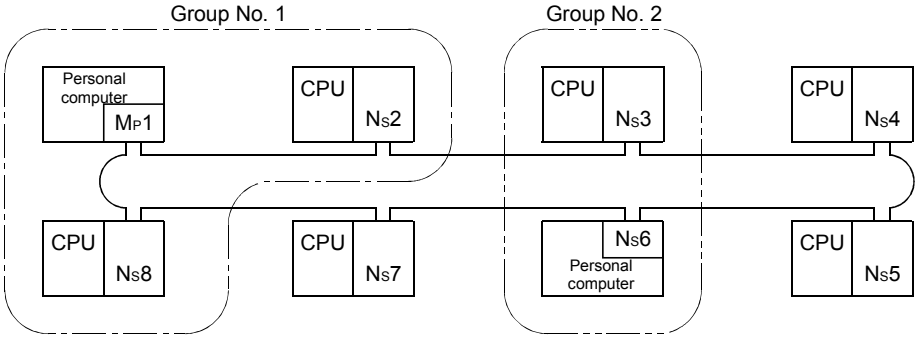
This sets the MELSECNET/H board's group No.
Set the group No. setting in the "Board Information" screen of the MNETH utility.

(1) Valid setting range

0: No group setting
1 to 9: When in the MELSECNET/10 Mode
1 to 32: When in the MELSECNET/H Mode and MELSECNET/H Extended Mode

(2) Cautions

(a) Only one Group No. can be set for 1 station.



7.2.5 Mode setting

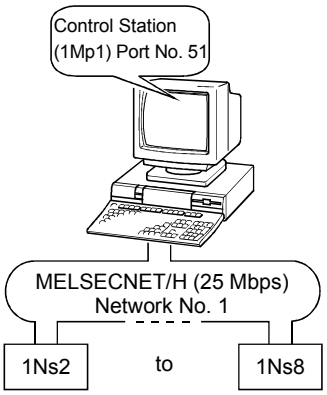
This sets the MELSECNET/H board's operating mode.

Selection item	Content
Online (auto. reconnection)	Normal operation (return to system) is selected. When the system is started up, data communications is started and automatic return to system operations, etc. are carried out.
Offline	Operation stop (disconnecting the station) is selected. Handshake and data communications with other stations is not done.
Forward loop test	The connection state with the forward loop side's optical fiber cable is checked. The hardware test operation is selected. For details, refer to section 6.5.5, "Forward loop / Reverse loop test."
Reverse loop test	The connection state with the reverse loop side's optical fiber cable is checked. The hardware test operation is selected. For details, refer to section 6.5.5, "Forward loop / Reverse loop test."
Test between master station	Selects the control station side for performing the hardware test for checking the lines between two stations. For details, refer to section 6.5.4, "Station to station test."
Test between slave station	Selects the normal station side for performing the hardware test for checking the lines between two stations. For details, refer to section 6.5.4, "Station to station test."
Self-loopback test	Selects a hardware test of the MELSECNET/H board itself with the connection cables. For details, refer to section 6.5.1, "Self-loopback test."
Internal self-loopback test	Selects a hardware test of the MELSECNET/H board itself. For details, refer to section 6.5.2, "Internal self-loopback test."
H/W test	Selects the internal hardware test for the MELSECNET/H board itself. For details, refer to section 6.5.3, "H/W test."

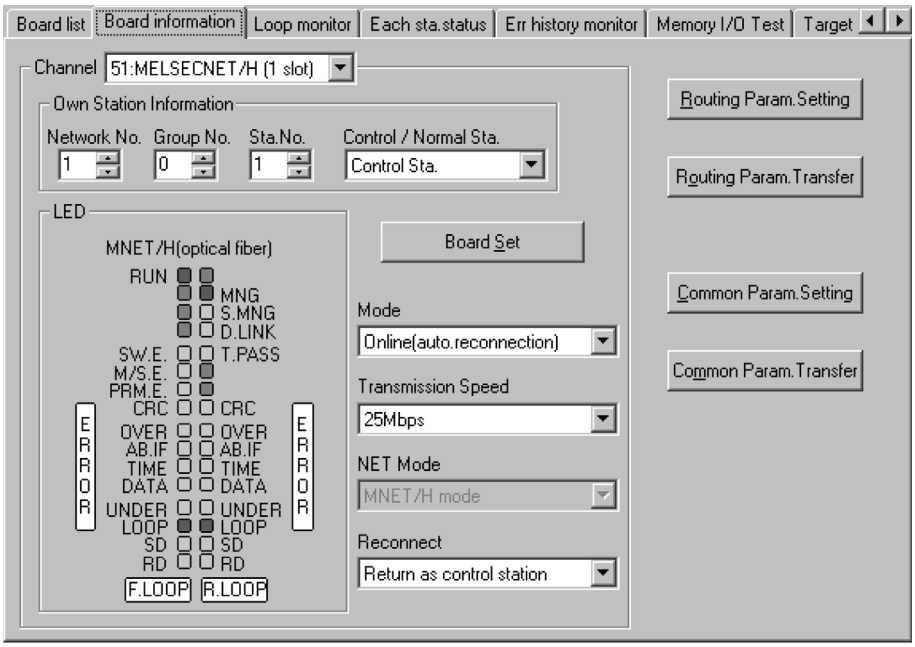
7.2.6 Parameter setting example

An example of setting the MELSECNET/H board parameters is shown below.

(1) System example



(2) Setting screen (Board information screen)



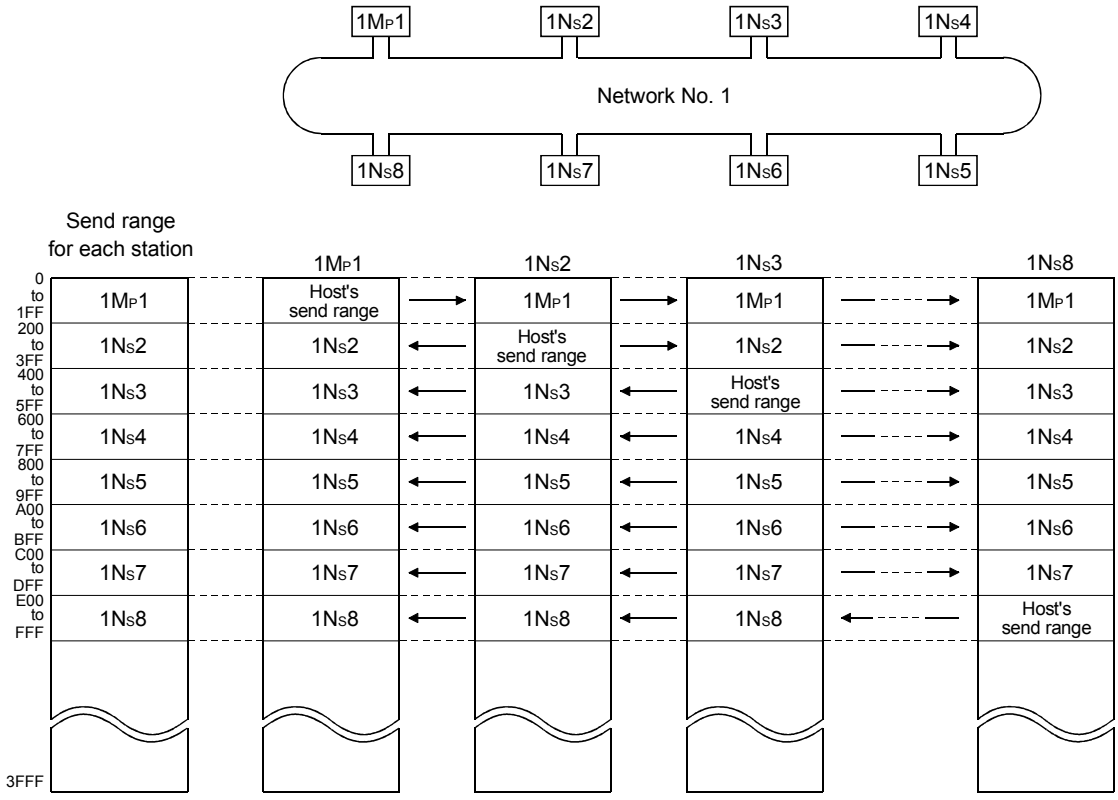
7.3 Common Parameters

The common parameters are used to set the cyclic transmission ranges of LB, LW, LX and LY that can be sent by each station in a single network. The common parameter settings are required only for the control station. The data of the common parameters are sent to the normal stations when the network starts up.

7.3.1 Send range for each station (LB/LW settings)

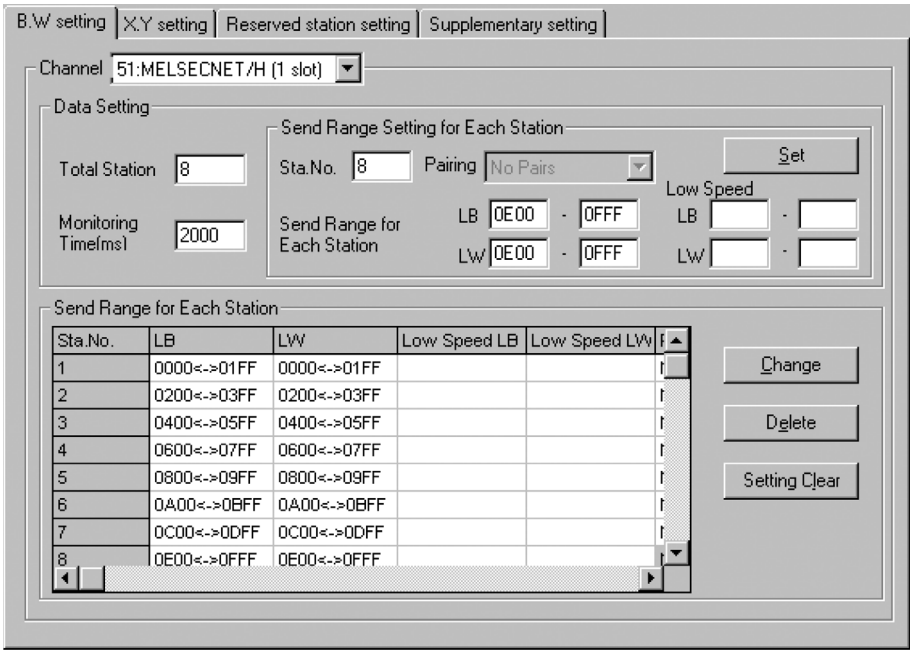
Assign the send ranges of the link devices (LB/LW) for each station in 16 point units for LB (start □□□ 0 to end □□□ F) and in one point unit for LW.
The following example shows send range for each station (LB/LW settings) when each of 512 points is assigned to station numbers 1 to 8.

(1) Setting example



(2) Screen settings (Common parameter setting screen)

Perform the setting of each station's transmission range (LB/LW settings) in the "Common parameter setting" screen in the MNETH utility.

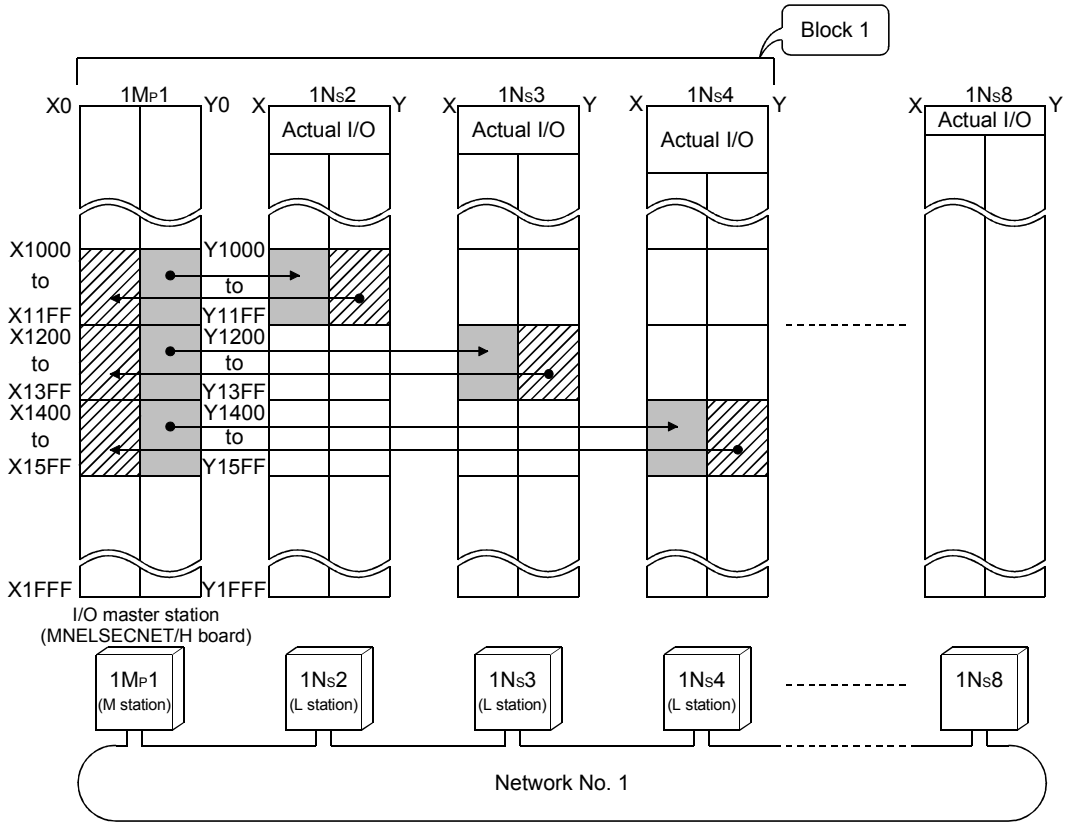


POINT
In order to validate the guarantee of 32-bit data, it is necessary that the number of points in each station's transmission range be a multiple of 20H for LB and a multiple of 2 for LW and that each station's top device No. be set so that the LB is a multiple of 20H and the LW is a multiple of 2. (For details on guaranteeing 32-bit data, refer to the "Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC Network)".)

7.3.2 Send range for each station (LX/LY settings)

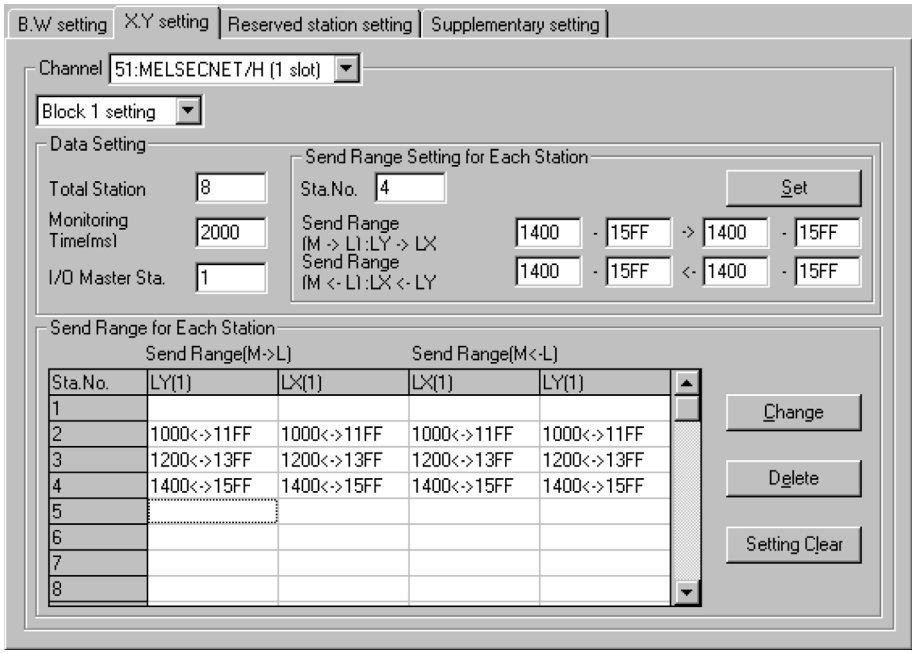
Set send ranges for each station of LX/LY, which represent the amount of data that can be sent by each station in a single network in one (two) block units.
The link devices (LX/LY) between the I/O master station (M station) and other station (L station) are assigned 1:1.
The following example shows send ranges for each station (LX/LY settings) when each of 512 points of link devices (LX/LY) is assigned to station numbers 2 to 4, using station number 1 (host) as the I/O master station of block 1.

(1) Setting example



(2) Screen settings (Common parameter settings)

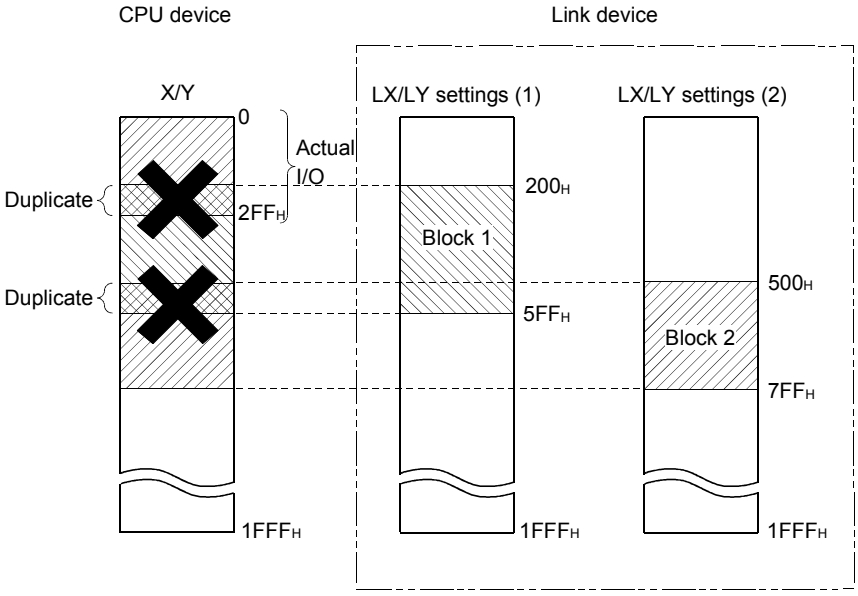
To set the transmission range for each station (LX/LY settings), perform the settings in "Common parameter settings" in the MNETH utility.



(3) Precaution

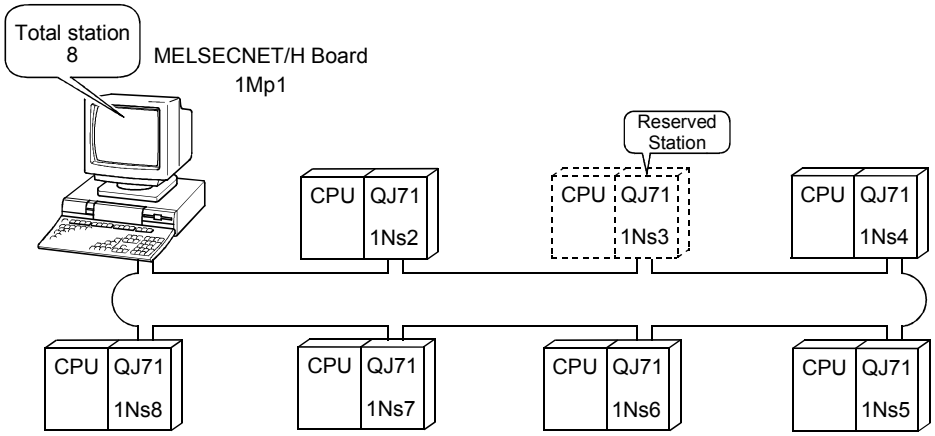
Duplicate link device ranges cannot be assigned to each station between block 1 and block 2.

If the network module is the I/O master station, they must be set not to duplicate with the actual I/O (the range of input/output numbers to which the actual module is installed) of the of the CPU module mounted.



7.3.3 Total station

This sets the total number of control stations, normal stations and reserved stations in a single network.
Set the total number of link stations in the "Common parameter settings" screen in the MNETH utility.



7.3.4 Designation of the I/O master station

The master station in each block for 1:1 communication using LX/LY can be specified as I/O master station regardless of either the control station or the normal station.
Each of block 1 and block 2 has one I/O master station, which is set by the send range (LX/LY) of each station in each block.
Specify the I/O master station with the "Common parameter setting" screen of the MNETH utility if the MELSECNET/H board is control station.

7.3.5 Reserved station setting

The reserved station designation function is used to prevent stations to be connected in future (stations that are not actually connected but included in the total number of (slave) stations of a network) from being treated as faulty stations.
The reserved stations do not affect the link scan time; they do not slow down the network even if used as reserved stations.
Specify the reserved station with the "Common parameter setting" screen of the MNETH utility.

7.3.6 Pairing Setting

In the pairing setting, station numbers of network modules composing a redundant CPU system can be set as pairs.

Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)

7.4 Supplementary Setting

The supplementary settings are included in the common parameter settings. They can be used when more specific applications are required. The default settings should normally be used.
The supplementary settings (common parameter settings) are required only for the control station. The parameters are sent from the control station to normal stations when the network starts up.
Perform the supplementary settings with the "Common parameter setting" screen of the MNETH utility.

7.5 Control Station Return Setting

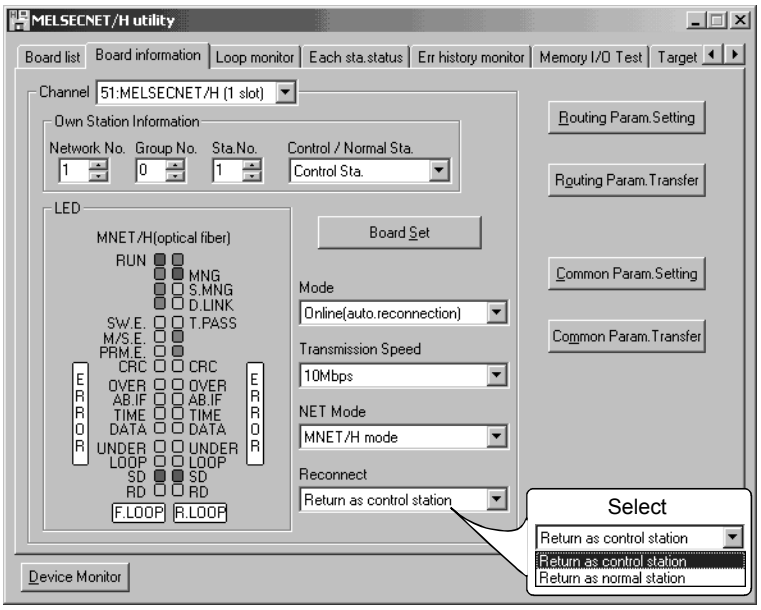
This parameter is used to designate the type of station used by the control station when returning to the network in the control station return control.
Select this parameter to make the control station return as a normal station without stopping the baton pass in the system in operation.
The control station return setting is required only for the control station.

(1) When "Return as control station" is selected (default)

The baton pass (cyclic transmission, transient transmission, etc.) temporarily stops because the control station sends the parameters to the normal stations and returns to the network.

(2) When "Return as normal station" is selected

The control station returns to the network as a normal station, without stopping the baton pass in the network.



REMARK

- When "Return as control station" is selected, the network stop time becomes longer because the baton pass is stopped, but the common parameters can easily be changed only by resetting the Board of the control station.
- If "Return as normal station" is selected, the network does not stop because the control station returns to the network without stopping the baton pass.
  However, it is necessary to reset the CPUs of all the stations after changing the common parameters of the control station while the network is in operation.
  If only the board resetting is performed, the MELSECNET/H board (Control station) detects the parameter mismatch error and disconnects it.

8 INSTALLING AND UNINSTALLING SOFTWARE PACKAGE

The methods for installing and uninstalling the software package are explained.

8.1 Installation and Uninstallation Precautions

The following are the precautions when installing and uninstalling the software package.

- Log on as a user having administrator authority.
- Make sure to close other applications running on Windows® (including resident software such as antivirus software) before installation and uninstallation.
- The installer may not work normally because the update program of operating system or other companies' software such as Windows® Update and Java update may start automatically. Please install the driver after changing the setting of the update program not to start automatically.
- Check if the display settings on the [Device Manager] or other relevant functions are correct, and install an appropriate display driver.
  Or update the Windows® operating system.
- The language switching function of the operation system set by "Regional and Language Options" on the Control Panel screen is not supported. The installation or uninstallation may not work normally if the language setting is changed.
- Default settings are set to the channel numbers and the parameters at the installation. Therefore, when a reinstallation of the software package is required, record the existing settings in advance, and reset the settings after the reinstallation. (Refer to Chapter 7)
- A network drive cannot be specified as the installation destination.

8.2 Installation

This section explains a procedure for installing software package.

(1) Installation

1) Insert the CD-ROM to the CD-ROM drive.
2) Double click the "Setup.exe" file on the CD-ROM.
3) By following the on-screen instructions, select or enter the necessary information.
(When the instruction displayed on the screen is not effective, refer to 14.2.3)
4) Restart the personal computer.

(2) When installation is completed normally

When the installation is completed normally, the following utilities are registered.

(a) Utility

When the installation is completed normally, the utilities shown below are registered in the "Start" *1 of Windows® .
*1: [Start screen] - [All apps] or [Start] - [All Programs]

Folder	Utility name	Description
[MELSEC]	MELSECNET/H Utility	Utility to setting board and displaying status.
	Device Monitor Utility	Utility to monitoring devices and changing the device value.

(b) MELSEC Data Link Library

When the installation is completed normally, the manual of MELSEC data link library is registered in the "Start" of Windows® .
MELSEC data link library is used for the following software packages in common.
When the utilities are installed on the same personal computer, the newer MELSEC data link library of the software package is enabled.

8

POINT

- In order to view the manuals, Adobe Reader is required.
  Adobe Reader can be downloaded from the Adobe Systems Incorporated web site.
- When using 64-bit version operating system, the icon may not be displayed even when Adobe Reader is installed.

Software package	Version	Manual name *1
SW0DNC-NETH-B	22Y or earlier	MELSEC Data Link Function HELP
	23Z or later	MELSEC Data Link Library Reference Manual
SW1DNC-CCBD2-B	1.10L or earlier	MELSEC Data Link Function HELP
	1.11M or later	MELSEC Data Link Library Reference Manual
SW1DNC-NETG-B	1.11M or earlier	MELSEC Data Link Function HELP
	1.12N or later	MELSEC Data Link Library Reference Manual
SW1DNC-CCIEF-B	1.00A	MELSEC Data Link Library Programmer's Reference
	1.02C or later	MELSEC Data Link Library Reference Manual *2

*1: Depending on other installed software packages, the manuals shown above may also be displayed. In this case, refer to "MELSEC Data Link Library Reference Manual".

*2: When SW1DNC-CCIEF-B Version 1.02C or later is installed, MELSEC Data Link Library Programmer's Reference is deleted.

(c) Driver

When installing the board on the personal computer after the installation of the software package, the driver is installed automatically *1.

*1: For Windows XP® and Windows Server 2003® R2, the driver is required to be specified on the "Found New Hardware Wizard" screen. Refer to 14.2.4.

When the driver installation is completed normally, the following driver is displayed on the Device Manager screen of Windows® .

Device	Driver
MELSECNET/H Device	PCI MELSECNET/H Controller

(d) Service application

To prevent a personal computer entering the power save mode (hibernate, sleep), MELSECPowerManager is installed automatically under the specific operating system.

For details of MELSECPowerManager , refer to Appendix 10.

(3) When installation is aborted or failed

When the installation is aborted or failed, take corrective actions following the troubleshooting. (Refer to Section 14.2.1)

8.3 Uninstallation

This section explains a procedure for uninstalling the software package.

(1) Uninstallation procedure

Uninstall the software package from the control panel of Windows® .

POINT
• If the dialog box confirming the deletion of common files appears at uninstallation, make the setting to keep all common files. If deleting common files, other applications may not operate normally. • MELSECPowerManager may not be uninstalled depending on the installation state which affects the other installed software packages. For details of MELSECPowerManager, refer to Appendix 10.

(2) When uninstallation is completed normally

When the uninstallation is completed normally, the icons registered in the Windows® Start menu are deleted.

(3) When uninstallation is failed

When the installation is aborted or failed, take corrective actions following the troubleshooting. (Refer to Section 14.2.2)

9 UTILITY OPERATIONS

9.1 Starting and Ending Utility

The following explains the operating method to start/end the utility.

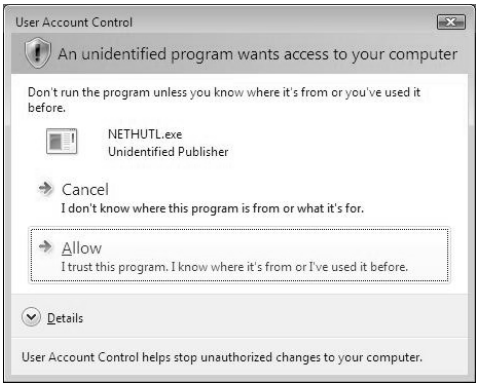
9.1.1 Starting a utility

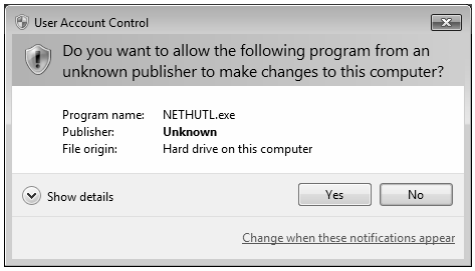
Start the utility by clicking the icon registered in the start[*1] of Windows® .
*1: [Start screen] - [All apps] or [Start] - [All Programs]

Folder	Utility name	Description	Reference
[MELSEC]	MELSECNET/H Utility	Utility to setting board and displaying status.	Section 9.2
	Device Monitor Utility	Utility to monitoring devices and changing the device value.	Section 9.3

POINT

When a utility is run while user account control (UAC) is available, the following warning screen appears. Select "Allow" or YES button to run the utility.


User Account Control
An unidentified program wants access to your computer
Don't run the program unless you know where it's from or you've used it before.
NETHUTL.exe
Unidentified Publisher
Cancel
I don't know where this program is from or what it's for.
Allow
I trust this program. I know where it's from or I've used it before.
Details
User Account Control helps stop unauthorized changes to your computer.


User Account Control
Do you want to allow the following program from an unknown publisher to make changes to this computer?
Program name: NETHUTL.exe
Publisher: Unknown
File origin: Hard drive on this computer
Show details
Yes
No
Change when these notifications appear

For details on how to prevent this screen from being displayed, refer to Appendix 8.

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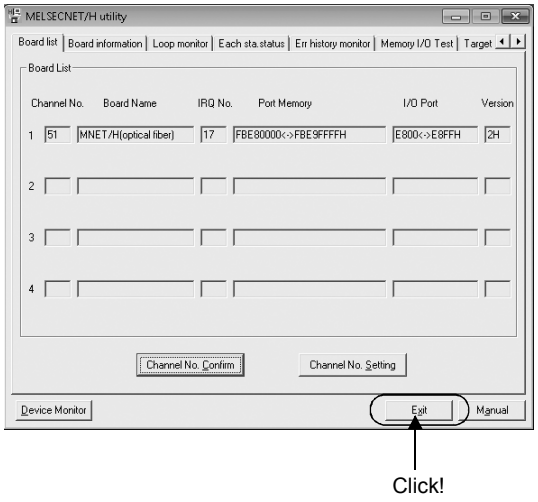
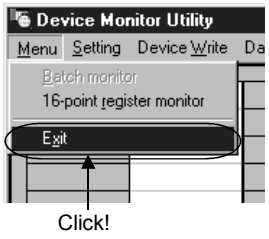
9.1.2 Ending a utility

The following explains how to end an utility.

(1) To end the MNETH utility, click the Exit button at the bottom of the utility screen.



(2) To end the device monitor utility, click [Menu] - [Exit] from the menu bar. When a dialog box is displayed, click the Yes button.



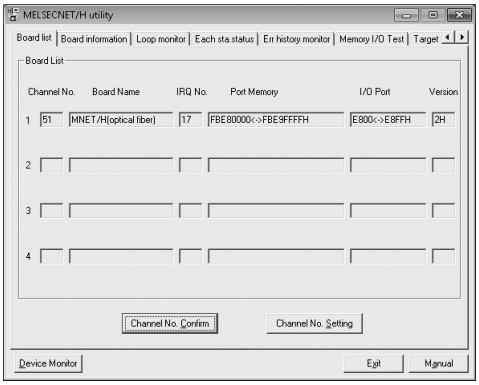
9

9.2 MNETH Utility

This section explains the MNETH utility's screen explanations and operation methods.

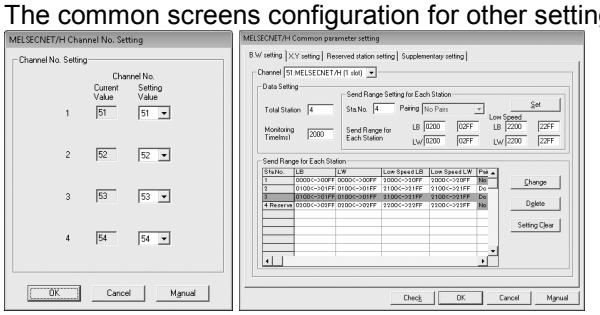
9.2.1 Screen configuration and basic operations

The following explains the screen configuration displayed at starting the MNETH utility.



Item		Description	Reference
Tab	Boad list	Displays the list of MELSECNET/H boards installed in the personal computer.	Section9.2.2
	Board information	Sets the own station information and each setting item.	Section 9.2.3 to 9.2.5
	Loop monitor	Displays the loop status of the host station.	Section 9.2.6
	Each sta. status	Displays the status of each station.	Section 9.2.7
	Error history monitor	Displays the error history.	Section 9.2.8
	Memory I/O Test	Diagnoses the dual-port memory and I/O ports used by the MELSECNET/H board.	Section 9.2.9
	Target	Sets the access target for accessing a multiple CPU system or redundant CPU system.	Section 9.2.10
	Driver	Sets the link device access method and each monitoring time.	Section 9.2.11
	Version	Displays the utility version.	-
Device Monitor button		Starts device monitor utility.	-
Exit button		Ends the MNETH utility.	-
Manual button		Displays this manual. ＊1	-

The common screens configuration for other setting are as shown below.



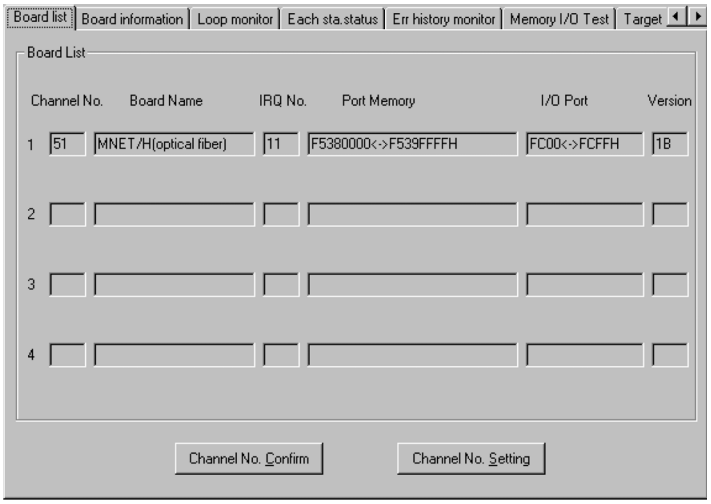
Item	Description
Check button	Checks the settings.
OK / Cancel button	Applies/discards the settings and closes the window.
Manual button	Displays this manual. ＊1

＊1: Adobe Reader is required. Adobe Reader can be downloaded from the Adobe Systems Incorporated web site.

9.2.2 Board list screen operation

This operation displays the hardware information, and confirms and sets the channel No. set in the MELSECNET/H board.

(1) Board List Screen



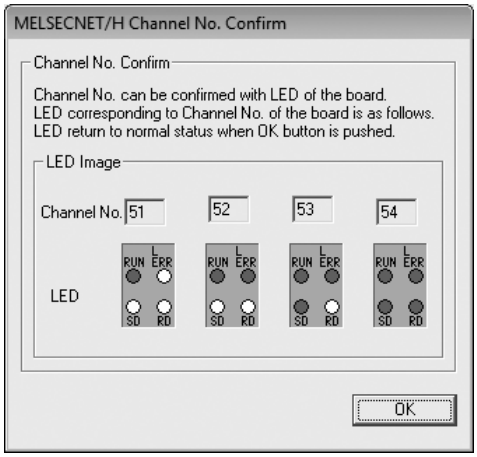
Item	Content
Channel No.	Displays the MELSECNET/H board's channel No.
Board Name	Displays the model name of the connected MELSECNET/H board. The contents displayed on the screen and the corresponding MELSECNET/H board's model name are as shown below. Screen Display: MNET/H (Optical fiber) — Model Name: Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE Screen Display: MNET/H (Coaxial) — Model Name: Q80BD-J71BR11
IRQ No.	Displays the IRQ used by the MELSECNET/H board.
Port Memory	Displays the range of dual-port memory occupied by the MELSECNET/H board.
I/O Port	Displays the range of the I/O ports occupied by the MELSECNET/H board.
Version	Displays the MELSECNET/H board's ROM version.
[Channel No. Confirm] Button	Displays the "Channel No. Confirm" screen. For details, refer to (2), "Channel No. Confirm."
[Channel No. Setting] Button	Displays the "Channel No. Setting" screen. For details, refer to (3), "Channel No. Setting."

REMARK

Channel numbers may change due to board replacements or alternations of PC device configurations. In such cases, check channel numbers and parameter settings with the “Board list” and “Board information” screens.

(2) Channel No. Confirm Screen

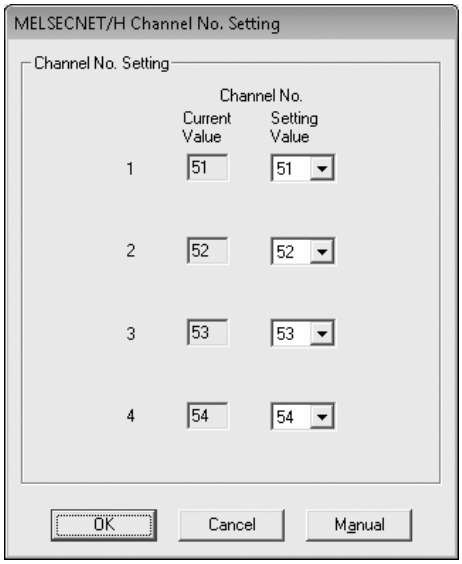
Clicking the Channel No. Confirm screen in the "Board List" screen displays the following dialog box, and enables the user to check the channel No. by the status of the display LED's on the MELSECNET/H board.



Item	Content
Channel No.	Displays the channel No. of the installed MELSECNET/H board.
LED	Displays the display LED lighting on status on the MELSECNET/H board.

(3) Channel No. Setting Screen

Clicking the Channel No. Setting screen in the "Board List" screen displays the following dialog box, and enables the user to change the channel No. of the MELSECNET/H board installed in the personal computer *1.

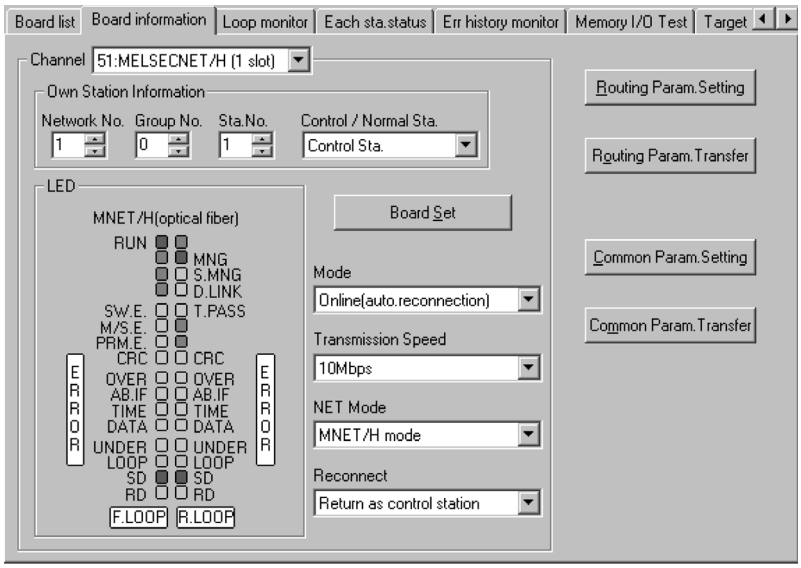


Item		Content
Channel	Current Value	Displays the current channel No.
	Setting Value	Changes the channel No. (Setting range: 51 to 54)

*1: Before changing channel No., exit Device Monitor Utility and all of user programs that are using the MELSEC data link library.

9.2.3 Board information screen operation

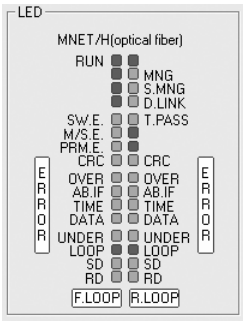
The Board information screen is used to set and display various information about the installed MELSECNET/H board.



Item	Content
Channel	Sets a channel (MELSECNET/H board) to be used.
Own Station Information	Displays information and changes setting on the host.
Board Set button	Resets the MELSECNET/H board to renew the information of the MELSECNET/H board selected in Channel.
Mode	Performs mode setting for the MELSECNET/H board, and displays the present value.
Transmission Speed	Selects the transmission speed. When the Q80BD-J71LP21G, Q80BD-J71LP21GE and Q80BD-J71BR11 is used and when "MNET10 Mode" is selected in the NET Mode, "25 Mbps" cannot be selected.

Mode	Description
Online (auto. reconnection)	Used for normal communication.
Offline	Enters the state in which there is no connection to the network.
Forward loop	Check the forward loop status.
Reverse loop	Check the reverse loop status.
Test between master station	Perform station to station test. (Select at control station)
Test between slave station	Perform station to station test (Select at normal station)
Self-loopback test	Check the hardware including the cable and communication circuit for transmission system by the MELSECNET/H board.
Internal self-loopback test	Check the hardware including the communication circuit for transmission system by the MELSECNET/H board.
H/W test	Check the hardware of the MELSECNET/H board.

Transmission speed	Description
10 Mbps	Selected when the MELSECNET/H (10 Mbps) is connected.
25 Mbps	Selected when the MELSECNET/H (25 Mbps) is connected.

<table>
<tr><th>Item</th><th>Content</th></tr>
<tr><td>NET mode</td><td>Selects the network where the MELSECNET/H board is connected. When "25 Mbps" is selected in the transmission speed item above, this item cannot be selected.
<table>
<tr><th>Net Mode</th><th>Description</th></tr>
<tr><td>MNET/H Mode</td><td>Selected when the MELSECNET/H is connected.</td></tr>
<tr><td>MNET/10 Mode</td><td>Selected when the MELSECNET/10 is connected.</td></tr>
<tr><td>MELSECNET/H Extended mode *1</td><td>Selected when the MELSECNET/H is connected and MELSECNET/H Extended mode is used.</td></tr>
</table></td></tr>
<tr><td>Reconnect</td><td>Designates by station type when a control station reconnects.
This item is displayed on the screen and can be selected only when the MELSECNET/H board is a control station.
<table>
<tr><th>Reconnect</th><th>Description</th></tr>
<tr><td>Return as control station</td><td>Causes the MELSECNET/H board to reconnect as a control station.</td></tr>
<tr><td>Return as normal station</td><td>Causes the MELSECNET/H board to reconnect as a normal station.</td></tr>
</table></td></tr>
<tr><td>LED</td><td>Display the operation status of the MELSECNET/H board.
<table>
<tr><th>LED name</th><th>LED status</th></tr>
<tr><td>RUN</td><td>Normal data link</td></tr>
<tr><td>MNG</td><td>Control station</td></tr>
<tr><td>S.MNG</td><td>Sub-control station</td></tr>
<tr><td>D.LINK</td><td>During data link</td></tr>
<tr><td>T.PASS</td><td>Baton pass execution *2</td></tr>
<tr><td>SW.E</td><td>Switch setting error</td></tr>
<tr><td>M/S.E.</td><td>Duplicate error on station number and control station</td></tr>
<tr><td>PRM.E.</td><td>Parameter error</td></tr>
<tr><td>CRC</td><td>Code check error</td></tr>
<tr><td>OVER</td><td>Data entry delay error</td></tr>
<tr><td>AB.IF</td><td>All receiving data are 1.</td></tr>
<tr><td>TIME</td><td>Time over</td></tr>
<tr><td>DATA</td><td>Reception data error</td></tr>
<tr><td>UNDER</td><td>Transmission data error</td></tr>
<tr><td>LOOP</td><td>Forward/reverse loop receiving error</td></tr>
<tr><td>SD</td><td>Data being transmitted</td></tr>
<tr><td>RD</td><td>Data being received</td></tr>
</table>

</td></tr>
<tr><td>[Routing Param. Setting] Button</td><td>Displays the "Routing Parameter Setting" screen.
Refer to section 9.2.4 Routing Parameter Setting operation for details.</td></tr>
<tr><td>[Routing Param. Transfer] Button</td><td>Transfers the routing parameter that has been set.</td></tr>
<tr><td>[Common Param. Setting] Button</td><td>Displays the "Common Parameters Setting" screen
This button is displayed only when the MELSECNET/H board is a control station.
Refer to section 9.2.5, "Common Parameters Setting Screen operation" for details.</td></tr>
<tr><td>[Common Param. Transfer] Button</td><td>Transmits the set common parameters.
This button is displayed only when the MELSECNET/H board is a control station.</td></tr>
</table>

*1: When assigning 2000 bytes or more to the number of link points sent by a station, set all stations including control stations and normal stations to the MELSECNET/H Extended mode.

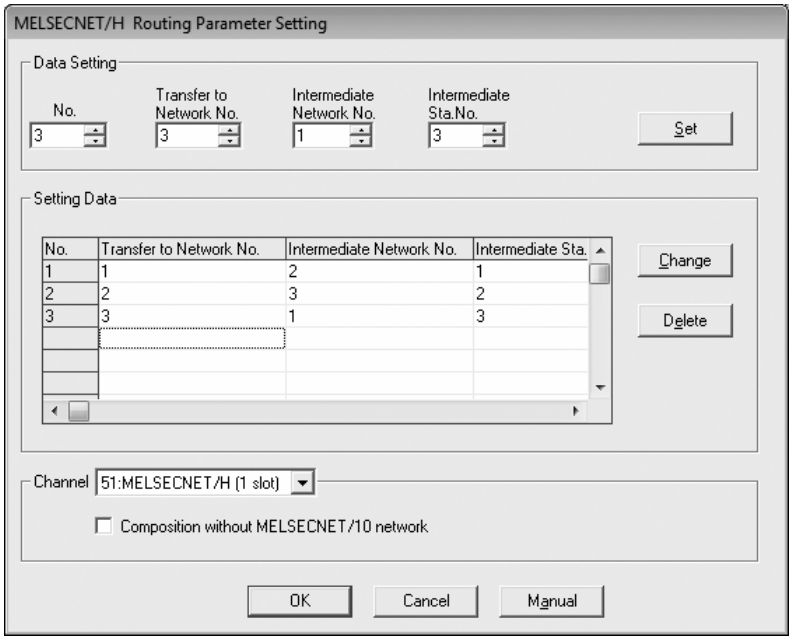
*2: If T.PASS LED flickers at uncertain intervals, take the corrective action by referring to Section 14.4.

9.2.4 Routing Parameter Setting screen operation

The routing parameter setting screen is used to set the transfer destination, relay destination network number, and relay destination station number.

POINT

(1) The routing parameters are common with channels No. 51 to 54.
They cannot be set one channel No. at a time.
(2) Up to 64 routine parameters can be set.



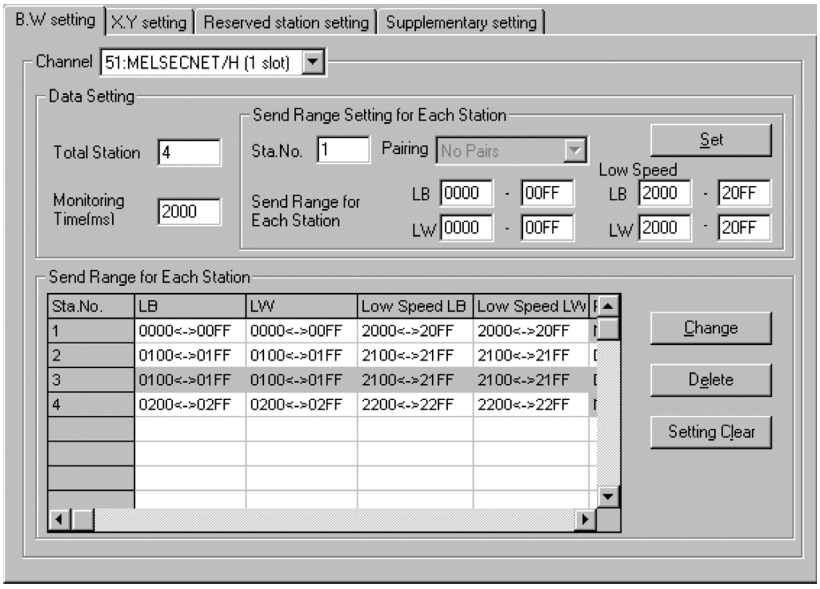
Item	Content
No.	Input the number of the line to set or change. (Setting range : 1 to 64)
Transfer to Network No.	Input the transfer destination network number
Intermediate Network No.	Input the relay destination network number
Intermediate Sta. No.	Input the relay destination station number.
Set button	Enters the data that has been set in Set data.
Setting Data	Displays a list of data that has been set so far.
Change button	Selecting a line to be changed and clicking the button will change the entered set data. (Double-clicking the line to be changed also does the same operation.)
Delete button	Selecting a line to delete and clicking the button will delete the entered set data.
Channel	Selects the channel No. where the settings are to be changed for the network configuration. If MELSECNET/10 does not exist on the routing path, select "Composition without MELSECNET/10 network" *1.

*1: If a MELSECNET/10 board exists in the network, do not select the checkbox. Due to the maximum transmitted data size (1920 byte for the configuration which is not including MELSECNET/10 and 960 byte for the configuration which is including MELSECNET/10) differs depending on the network system configuration, the data will be missed at transmission via MELSECNET/10.

9.2.5 Common parameter setting screen operation

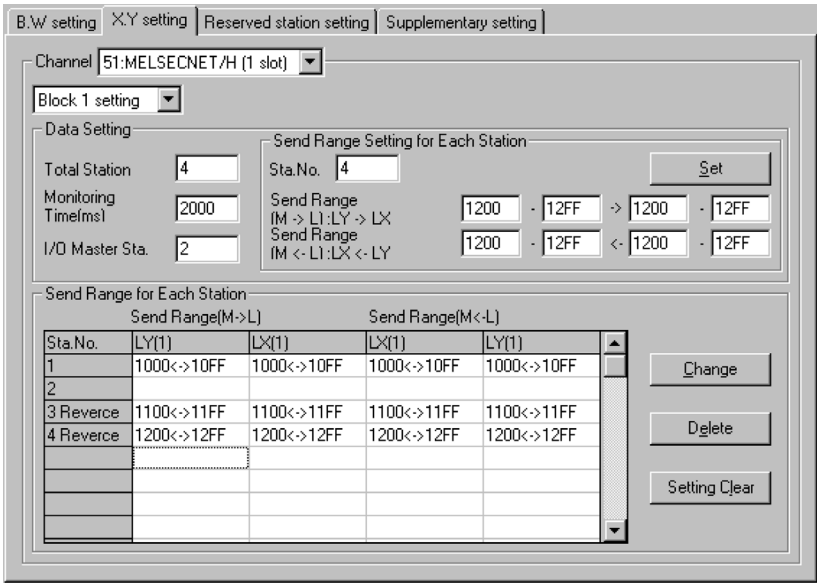
This operation sets the common parameters necessary for establishing data links.
Display is possible only when the MELSECNET/H board is in the control station.

(1) B, W setting screen



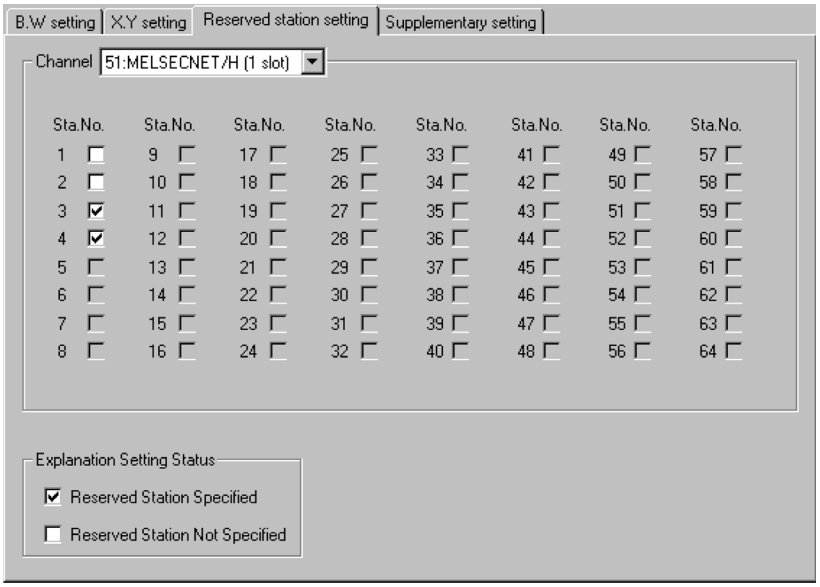
Item		Content
Channel		Selects the channel (MELSECNET/H board) performing the settings.
Total Station		Input the total number of stations (including the control station) in the network that the MELSECNET/H board is the control station for.
Monitoring Time		Sets the link scan time monitoring time.
Send Range for Each Station	Sta. No.	Input the station No. of the station to be set or changed.
	Pairing	Set whether pairing is enabled or not. • If "Do Pairs" is selected, settings for the next station No. become the same as those for the current one, being displayed with its "Send Range for Each Station" area masked. • Pairing is not available if the last station No. is selected for "Sta. No. "
	LB	Input the LB (Link relay) range.
	LW	Input the LW (Link register) range.
	Low Speed LB	Input the range of the LB (link relay) used in the low speed cyclic transmission function.
	Low Speed LW	Input the range of the LW (link register) used in the low speed cyclic transmission function.
Set button		Registers the set contents in each station's transmission range.
Send Range for Each Station		Displays the set data contents up to the present time in one list.
Change button		Select the line to change, then when the button is clicked, the data which are registered can be changed. (If the line to be changed is double clicked, the same operation can be performed.)
Delete button		Select the line to change, then when the button is clicked, the data which are set can be deleted.
Settings Clear Button		Initializes the contents of all the B and W settings registered in the "Common parameter setting" screen.

(2) X, Y setting screen



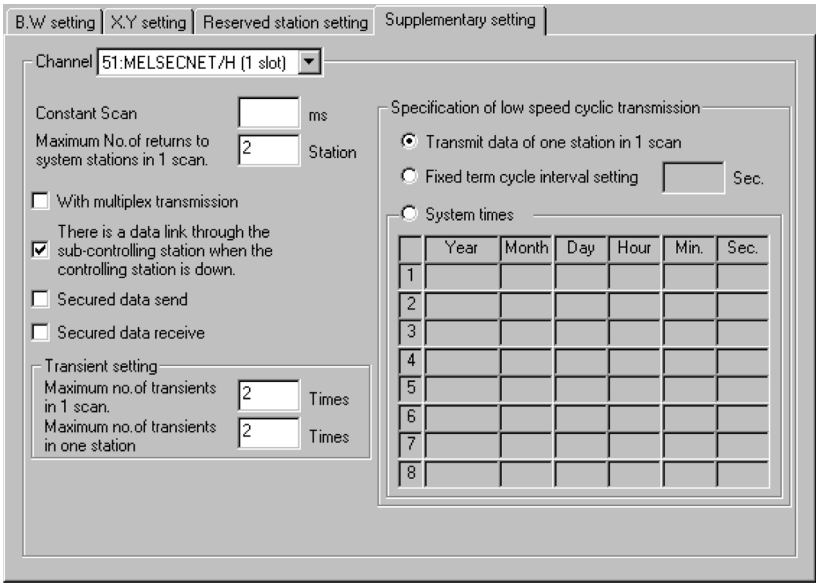
Item		Content
Channel		Selects the channel (MELSECNET/H board) performing the settings.
Block 1 setting (Block 2 setting)		Switches the block that is set.
Total station		Input the total number of stations (including the control station) in the network that the MELSECNET/H board is the control station for.
Monitoring Time		Sets the link scan time monitoring time.
I/O Master Sta.		Input the station No. of the I/O master station.
Send Range for Each Station	Sta. No.	Input the station No. of the station to be set or changed.
	Sending Range (M → L)	Assigns link devices (LX, LY) 1 to 1 between the I/O master station (M station) and other stations.
	Sending Range (M ← L)	Assigns link devices (LX, LY) 1 to 1 between the I/O master station (M station) and other stations.
Set button		Registers the set contents in each station's transmission range.
Send Range for Each Station		Displays the set data contents up to the present time in one list.
Change button		Select the line to change, then when the button is clicked, the data which are registered can be changed. (If the line to be changed is double clicked, the same operation can be performed.)
Delete button		Select the line to change, then when the button is clicked, the data which are set can be deleted.
Setting Clear Button		Initializes the contents of all the X and Y settings registered in the "Common parameter setting" screen.

(3) Reserved station setting screen



Item	Content
Channel	Selects the channel (MELSECNET/H board) performing the settings.
Sta. No.	This sets reserve stations. If a check mark is placed in the check box, that station is set as a reserve station.

(4) Supplementary setting screen

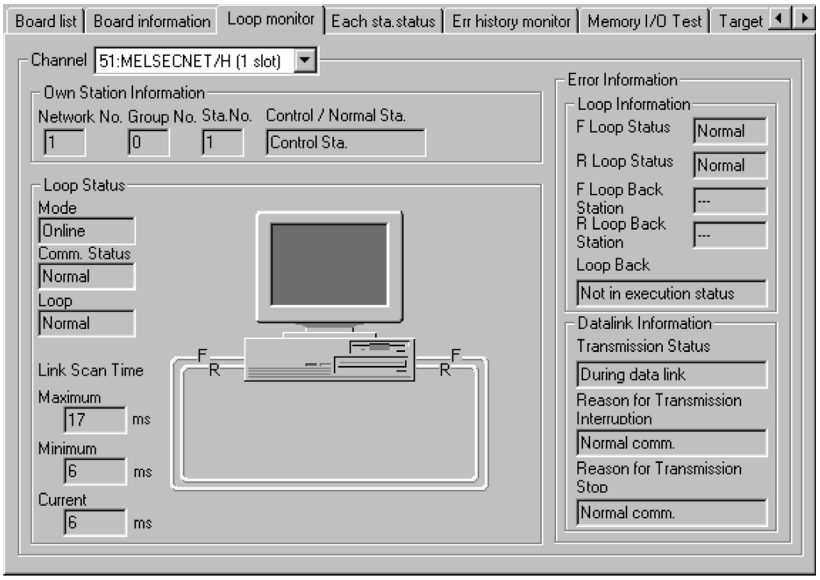


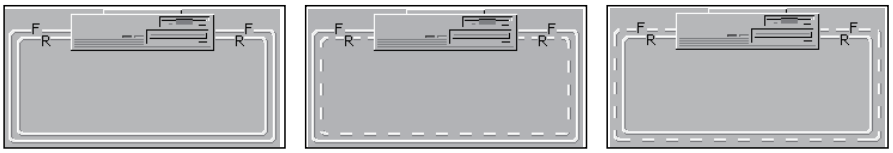
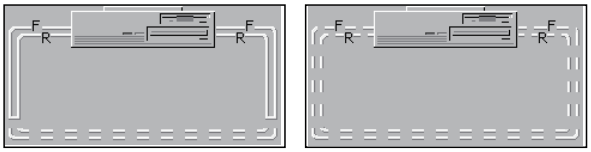
Item		Content
Channel		Selects the channel (MELSECNET/H board) performing the settings.
Constant scan		Sets a constant link scan. (Setting range: 1 to 500 ms) If it is not run, do not input anything.
Maximum No. of returns to system stations in 1 scan		Sets the number of stations with transmission errors that can undergo return to system in 1 link scan.
With multiplex transmission		Set when running the multiplex transmission function.
There is a data link through the sub-controlling station when the controlling station is down.		Set when executing the control station move function.
Secured data send		Set when preventing data separation of link data in station units in cyclic transmissions. ＊1
Secured data receive		
Transient setting	Maximum No. of transients in 1 scan.	Sets the number of transients that can be executed in one link scan by one network (total for 1 network as a whole). (Valid setting: 1 to 255 times; Default: 2 times)
	Maximum No. of transients in one station.	Sets the number of transients that can be executed in one link scan by one station. (Valid setting: 1 to 10 times; Default: 2 times)
Specification of low speed cyclic transmission	Transmit data of one station in 1 scan	Set in cases such as when data to be transmitted to another station are collected and sent one station at a time in 1 link scan.
	Fixed time cycle interval setting	Carries out low speed cyclic transmission at the preset intervals. (Valid setting interval: 1 to 65535 s.)
	System times	Carries out low speed cyclic transmission in accordance with the preset time. (Settings: Year, Month, Day, Hour, Minute, Second)

＊1: Data separation prevention is when older data with the meaning of 2-word (32 bit) link data such as the positioning unit's current position are prevented from being separated into new data with 1-word (16 bit) units due to cyclic transmission timing.

9.2.6 Loop monitor screen operation

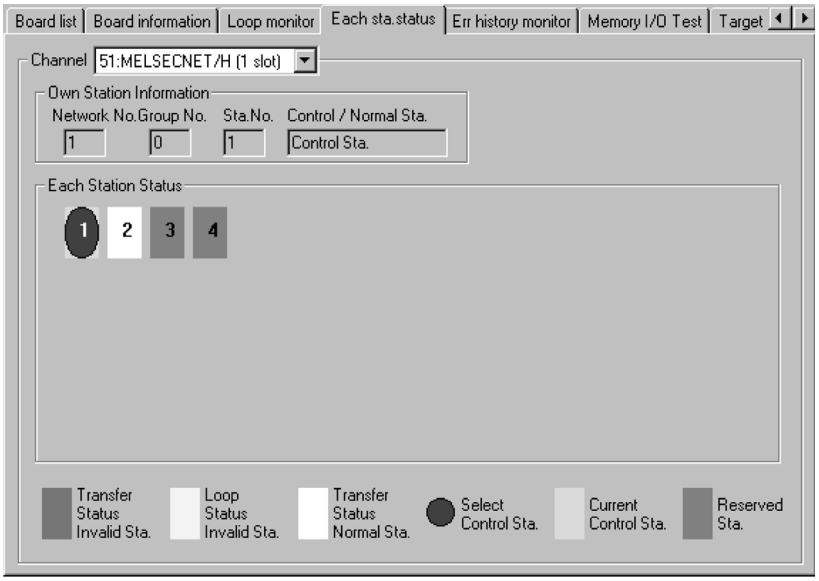
This screen is used to monitor the loop status of the host.



Item	Content
Channel	Sets the channel (MELSECNET/H board) perform loop monitor.
Own Station Information	Displays the host information.
Loop Status	Displays the host's loop status using characters and graphics. Also, images are changed as shown below according to the connection status. <For Q80BD-J71LP21-25,Q81BD-J71LP21-25,Q80BD-J71LP21S-25,Q80BD-J71LP21G and Q80BD-J71LP21GE>  Forward loop : Normal Reverse loop : Normal Forward loop : Normal Reverse loop : Abnormal Forward loop : Abnormal Reverse loop : Normal  Data link by loop-back Forward loop : Abnormal Reverse loop : Abnormal <For Q80BD-J71BR11> Display the same regardless of the loop status.
Loop Information	Displays current loop status.
Datalink Information	Displays the current data link status.

9.2.7 Each station status screen operation

This screen displays communication status and loop status for each station.



Item	Content
Channel	Sets the channel (MELSECNET/H board) perform each station status.
Own Station Information	Displays the host information.
Each Station Status	Displays the communication status and loop status for every link station that is set using parameters. (Red) Transfer Status Invalid Sta.····· Indicates a baton-pass status error. (Yellow) Loop Status Invalid Sta.····· Indicates a forward/reverse loopstatus error. (White) Transfer Status Normal Sta.····· Indicates the station in normal communication. (Blue) Select Control Sta.····· Indicates the station that is set as the control station. (Aqua) Current Control Sta.····· Indicates the station that is actually operating as the control station. (Gray) Reserve Sta.····· Indicates the station that is set as a reserved station. However, this is valid only when the host is executing cyclic communication.

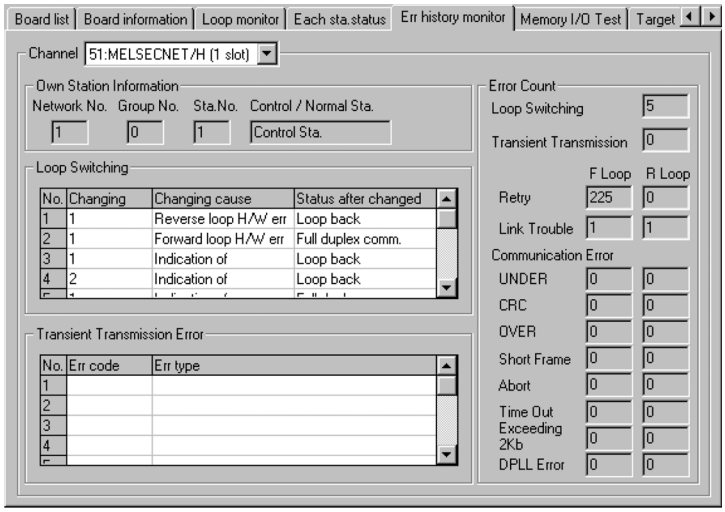
9.2.8 Error history monitor screen operation

This screen displays the history of loop errors, communication errors, and transient transmission errors.

POINT

(1) Up to 16 items are stored in the loop switch data history.
When there are more than 16 items, items will be erased from the history, starting with the oldest one.
(From old to new: No. 1 to No. 16)

(2) Refer to the following manuals for details on the error code and error type of a specific transient transmission error that may be displayed:
- Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)
- For QnA/Q4AR MELSECNET/10 Network System Reference Manual



Item	Content
Channel	Sets the channel (MELSECNET/H board) perform error history monitor.
Own Station Information	Displays the host information.
Loop Switching	Displays the loop change factors and status after changing. (For optical loop)

Item	Description
Sta. No.	Displays the station number that requested a loop switch and loop back.
Factor	Displays the factor by which loop switch and loop back were executed.
Switched to	Displays the data link status after a loop switch.

<table>
<tr><th>Item</th><th>Content</th></tr>
<tr><td>Transient Transmission Error</td><td>Displays the error code occurring when transient transmission was executed at the host.
<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Error code</td><td>Displays the code of the error occurring due to transient transmission.</td></tr>
<tr><td>Error type</td><td>Displays the type of the error occurring due to transient transmission.</td></tr>
</table></td></tr>
<tr><td>Error Count ＊1</td><td>Displays the number of error occurrences.
<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Loop Switching</td><td>Displays the number of loop switch/loopback.</td></tr>
<tr><td>Transient Transmission</td><td>Displays the number of error occurrence due to transient transmission.</td></tr>
<tr><td>Retry</td><td>Displays the number of retries (retry at communication error).</td></tr>
<tr><td>Link Trouble</td><td>Displays the number of line error occurrence.</td></tr>
<tr><td>Communication Error</td><td>
<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>UNDER</td><td>Displays the number of UNDER errors.</td></tr>
<tr><td>CRC</td><td>Displays the number of CRC errors.</td></tr>
<tr><td>OVER</td><td>Displays the number of OVER errors.</td></tr>
<tr><td>Short Frame</td><td>Displays the number of short frame (data message is too short.) errors.</td></tr>
<tr><td>Abort</td><td>Displays the number of AB.IF errors.</td></tr>
<tr><td>Time Out</td><td>Displays the number of Time Out errors.</td></tr>
<tr><td>Exceeding 2 kb</td><td>Displays the number of Exceeding 2Kb errors.</td></tr>
<tr><td>DPLL Error</td><td>Displays the number of DPLL (Cannot identify data normally due to synchronization/modulation) errors.</td></tr>
</table></td></tr>
</table></td></tr>
</table>

*1 : The following explains the error causes and the corresponding corrective actions.
In addition to Error history monitor screen, they can be confirmed using the following link special registers (SW). For more information of each link special registers (SW), refer to "Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)".

Item	Link special register	Error cause	Corrective action
Loop Switching	SW00CEH	Power ON/OFF status of the station, cable fault, noise, etc.	*2
Transient transmission	SW00EEH	Power ON/OFF status or CPU module error of the external station, cable fault, noise, etc.	Confirm the error code of the transient transmission error, and then take the corrective action.
Retry	SW00C8H, SW00C9H	Power ON/OFF status of the station, cable fault, noise, etc.	*2
Link Trouble	SW00CCH, SW00CDH	Power ON/OFF status of the adjacent station, cable fault, noise, etc.	*2
UNDER	SW00B8H, SW00C0H	Power ON/OFF status of the adjacent station, cable fault, etc.	*2
CRC	SW00B9H, SW00C1H	Disconnection status of the station that sends data to the corresponding station, cable fault, hardware error, noise, etc.	*2
OVER	SW00BAH, SW00C2H	Cable fault, Hardware error, noise, etc.	*2
Short Frame	SW00BBH, SW00C3H		*2
Abort	SW00BCH, SW00C4H	Disconnection status of the station that sends data to the corresponding station, cable fault, hardware error, noise, etc.	*2
Time Out	SW00BDH, SW00C5H	Insufficient data link monitor time, cable fault, noise, etc.	*2
Exceeding 2Kb	SW00BEH, SW00C6H	Cable fault, Hardware error, noise, etc.	*2
DPLL Error	SW00BFH, SW00C7H		*2

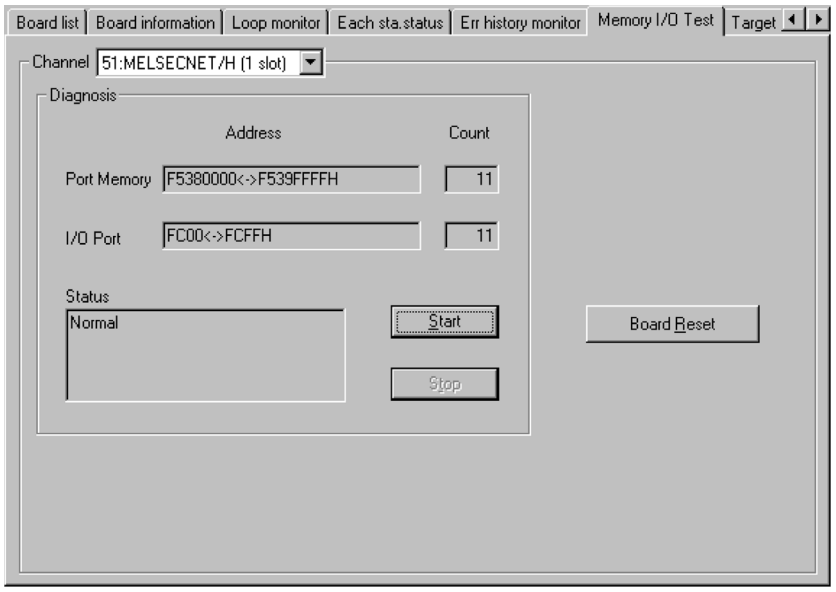
*2 : Basically, the number of times for each error occurrence does not matter. However, following corrective actions are required, if the count value raises frequently during operation.
(1) Confirm the power ON/OFF statuses of the host station and other station.
(2) Check the cable and connector (connector disconnection, loose connection, cable breakage, cable length, etc.).
(3) Conduct self - loopback test, internal self-loopback test and hardware test.
(4) Conduct station to station test and forward/reverse loop test.
(5) Wire the cable again with reference to the network module manual and MELSECNET/H board manual. In addition, install the devices again with reference to the user's manual for the CPU module.

9.2.9 Memory, I/O Test screen operation

This operation diagnoses between the MELSECNET/H board and personal computer.

POINT

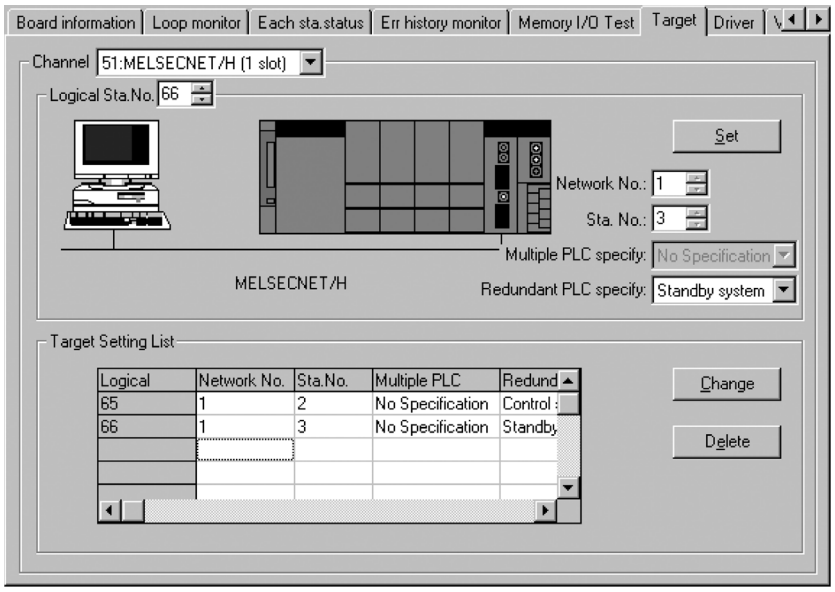
(1) If you are starting the diagnosis, do so after disconnecting the external cables.
(2) If you desire to switch screens during the diagnosis, click the Stop button, switching screens after stopping the diagnosis.



Item	Content
Channel	Sets the channel (MELSECNET/H board) perform the memory, I/O diagnosis.
Diagnosis	Displays the address where the diagnosis is being performed, the number of times it is being performed and the status.
Start Button	Starts the memory, I/O diagnosis.
Stop Button	Stops the memory, I/O diagnosis.
Board Reset Button	Resets the MELSECNET/H board.

9.2.10 Target screen operation

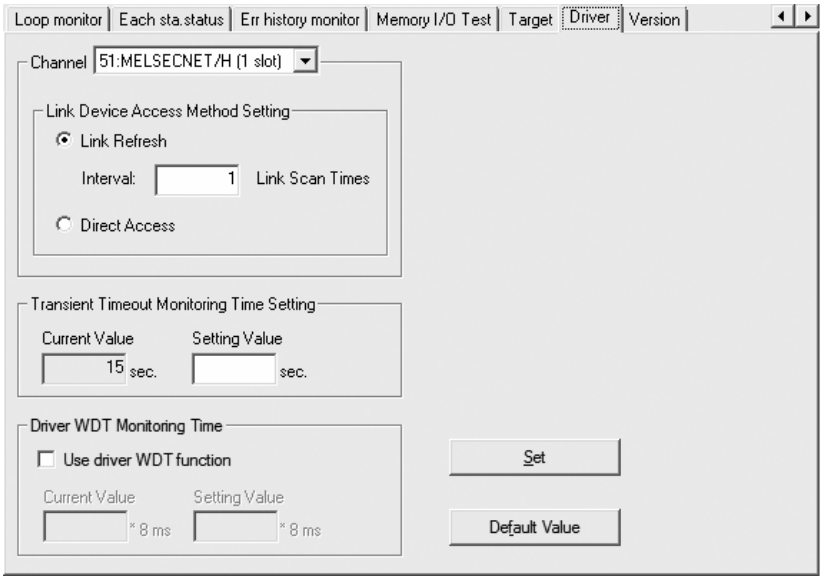
This operation sets the logical station No. for access to a multiple CPU system or Redundant CPU system.



Item	Content
Channel	Sets the channel (MELSECNET/H board) perform the target settings.
Logical Sta. No.	Input the logical sta. No. which is setting or changing the settings.
Network No.	Input the network No. of the station doing the accessing.
Sta. No.	Input the station No. of the network module controlled by the multiple CPU system or redundant CPU system.
Multiple PLC specify	Specify a target programmable controller CPU No. in the multiple CPU system.
Redundant PLC specify	Specify a target redundant CPU in the redundant CPU system.
Set Button	Registers the setting contents in the list of external devices.
Change Button	Select the line to change. When this button is clicked, the data that are registered can be changed. (The same operation is performed when the line being changed is double clicked.)
Delete Button	Select the line to be deleted. When this button is clicked, the registered logical station No. can be deleted.

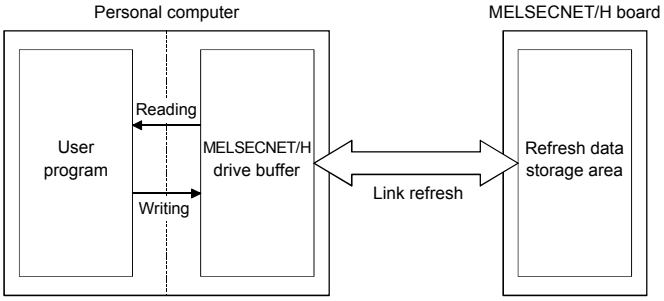
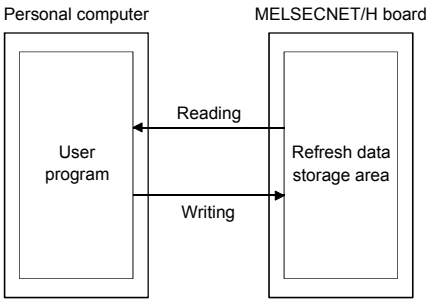
9.2.11 Driver screen operation

This operation sets the combination settings between the MELSECNET/H board and MELSECNET/10 board and sets the link device access method and the time for each type of monitoring.



Item	Content
Channel	Sets the channel (MELSECNET/H board) which sets the link device access method.
Link Device Access Method Setting	Sets the access method to link devices (LX, LY, LB, LW). (Refer to (1) in this section) When Link Refresh is selected, specify the link refresh interval.
Transient Timeout Monitoring Time Setting	Displays the current value for the transient time out monitoring time and inputs the setting value.
Driver WDT Monitoring Time	Select "Use driver WDT function" to enable the function. Displays the current value for the Driver WDT Monitoring Time and inputs the setting value. (1 to 32767)
[Set] Button	Enables the setting contents. The channel No. settings are reassigned after the [Set] button is clicked.
[Default Value] Button	Returns the set contents to the default values.

(1) Link Device Access Method

Item	Description
Link Refresh	Makes access to the MELSECNET/H driver buffer. Data in the MELSECNET/H driver buffer and the refresh data storage area on the MELSECNET/H board are updated by link refresh. When secured data handling is specified with the control station parameter, data consistency *1 of link device data is ensured. 
Direct Access	Provided for MELSECNET/10 compatibility. Makes access to the refresh data storage area on the MELSECNET/H board. Data consistency *1 of link device data is not ensured even if secured data handling is specified with the control station parameter. 

*1: Data consistency function prevents 2-word (32 bits) link data (e.g. current value of a positioning module) from being divided into two 1-word (16bits) data (old and new data) by certain cyclic transmission timing.

(a) Link Refresh Interval

Link refresh is performed at intervals of the specified value multiplied by link scan time. The load of the link refresh processing by the MELSECNET/H driver on the PC decrease in inverse proportion to this value.
The specified interval value changes the delay time, which is duration from when link device data arrive at the refresh data storage area on the MELSECNET/H board until they are read out into the user program. (Refer to POINT.)

POINT

(1) Relation between link refresh interval value and delay time in data reading

The maximum delay time ($T_{D(MAX)}$) from when link device data arrive at the refresh data storage area on the MELSECNET/H board until they are read out into the user program can be obtained from the following formula.

Maximum delay time, $T_{D(MAX)} = T_{UP} + (n-1) \times T_{LS}$

T_{UP} : Interval for reading link device data from user program

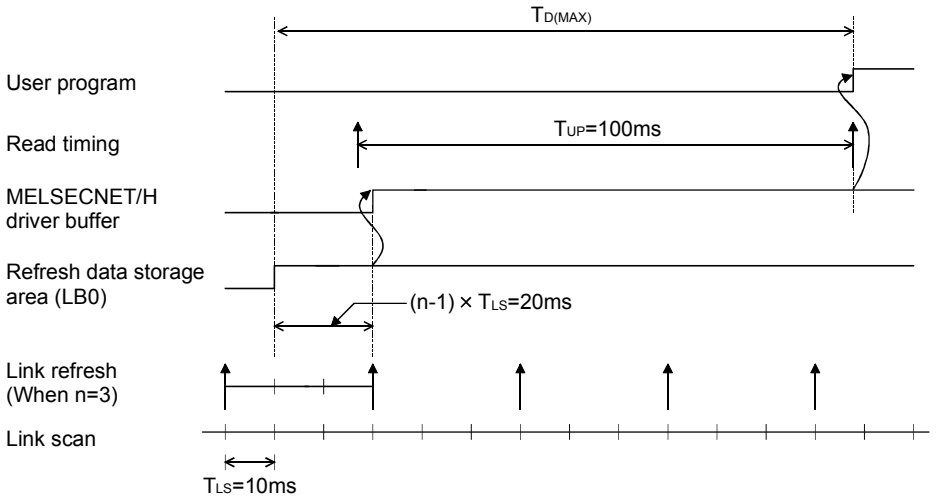
n : Specified interval value

T_{LS} : Link scan time

The following shows an example of accessing LB0 under conditions: T_{UP} = 100ms, n = 3, T_{LS} = 120ms.

The maximum delay time, $T_{D(MAX)}$ is:

$T_{D(MAX)}$ = 100ms + (3-1) x 10ms = 120ms



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9.3 Device Monitor Utility

The following explains how to set and operate the device monitor utility.

POINT
In the device monitor utility, SB (Link special relay) and SW (Link special register) are indicated as SM and SD, respectively.

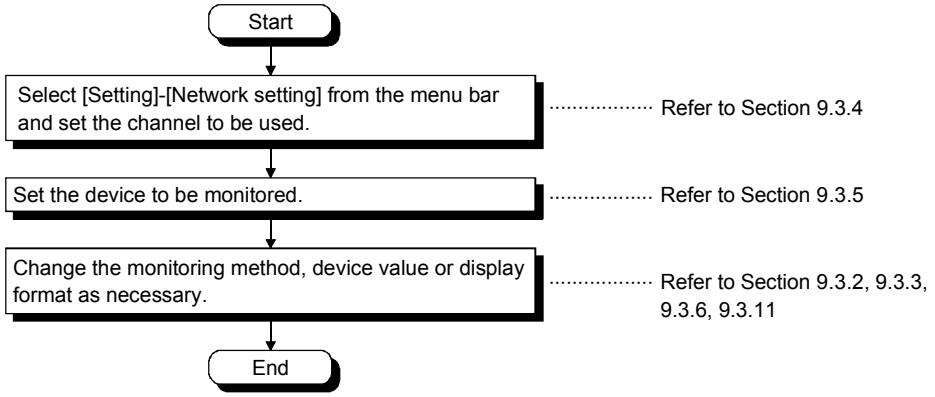
9.3.1 Overview

(1) Overview

Device monitor utility is a utility to monitor devices and change current values.

(2) Operation procedure

The following explains how to operate the device monitor utility.


Start
Select [Setting]-[Network setting] from the menu bar and set the channel to be used.
Refer to Section 9.3.4
Set the device to be monitored.
Refer to Section 9.3.5
Change the monitoring method, device value or display format as necessary.
Refer to Section 9.3.2, 9.3.3, 9.3.6, 9.3.11
End

(3) List of the functions

The following explains the functions of the device monitor utility.

Function		Description	Reference
Menu	Batch monitor	Batch monitors one type of devices.	Section 9.3.2
	16-point register monitor	Monitors multiple devices simultaneously in units of 16 points.	Section 9.3.3
	Exit	Exits the device monitor utility.	Section 9.1.2
Setting	Network Setting	Sets a programmable controller CPU or board to be monitored.	Section 9.3.4
	Device setting	Set devices to be monitored.	Section 9.3.5
Device Write	Data changing	Changes word device values.	Section 9.3.6
	Continuous Change in Data	Changes sequenced word devices to a same value.	Section 9.3.7
	Bit device set	Turns bit devices ON.	Section 9.3.8
	Bit device reset	Turns bit devices OFF.	
Data Format	Word device	Changes a display format of word devices.	Section 9.3.9
	Bit device	Changes a display format of bit devices.	
Option	Numerical Pad	Enables/disables the setting to use the numerical pad.	Section 9.3.10
Help	Help	Displays the help screen.	-
	Version	Displays the version information.	-

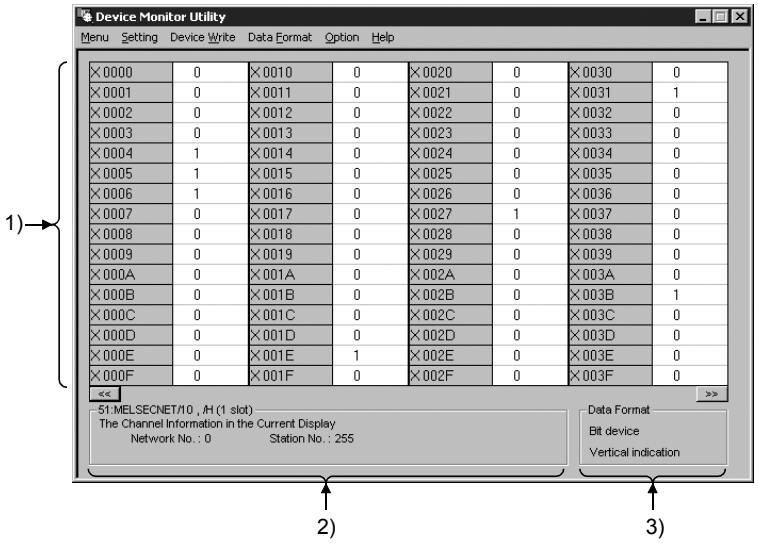
9.3.2 Setting as batch monitoring

Monitors only one device that has been specified.

(1) Selecting the menu

Select [Menu] - [Batch monitoring] from the menu bar.
(Selectable for 16-point entry monitor only.)

(2) Display screen



Item	Content
1) Device information	Displays the current device status. Refer to Section 9.3.9 on how to change the display form.
2) Network status	Displays the network status currently set. Refer to Section 9.3.4 on how to set the network.
3) Data format	Shows the display form and device types being displayed (word device and bit device). Refer to Section 9.3.5 on how to change the device type. And, refer to Section 9.3.9 on how to change the display form.

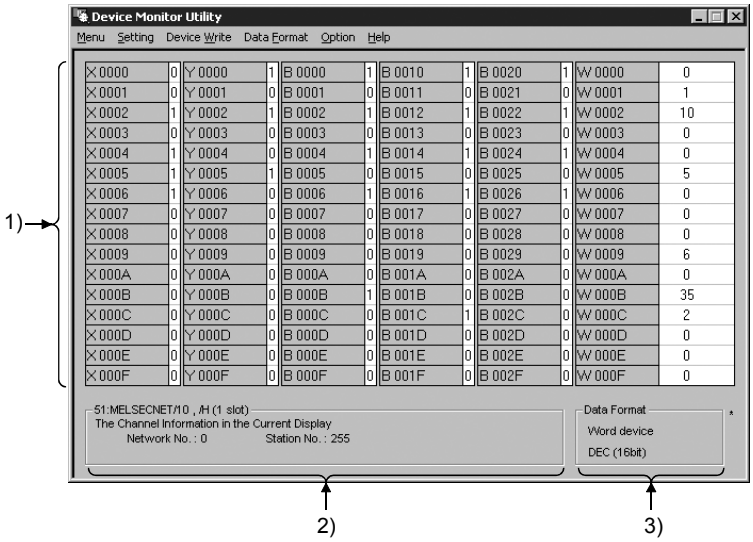
9.3.3 Setting as 16 point entry monitor

Monitors up to five bit devices and one word device simultaneously.

(1) Selecting the menu

Select [Menu] - [16 point entry monitor] from the menu bar.
(Selectable at batch monitoring only.)

(2) Display screen



Item	Content
1) Device information	Displays the current device status. Refer to Section 9.3.9 on how to change the display form.
2) Network status	Displays the network status currently set. Refer to Section 9.3.4 on how to set the network.
3) Data format	Shows the display form and device types being displayed (word device and bit device). Refer to Section 9.3.5 on how to change the device type. And, refer to Section 9.3.9 on how to change the display form.

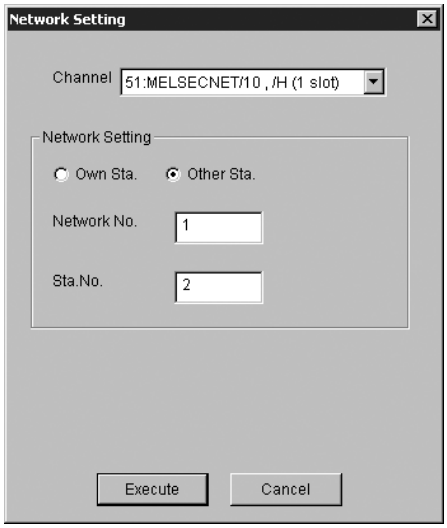
9.3.4 Setting the monitoring destination

Sets the network to be used for device monitoring.
Set the destination when starting the device monitor utility.

(1) Selecting the menu

Select [Setting] - [Network Setting] from the menu bar.

(2) Dialog box



Item	Content
Channel	Set the channel to be used.
Network Setting	Set the own and other stations along with network number and station number.
Logical Sta. No.	Set the logical station number.

POINT

(1) In case of accessing to the multiple CPU, select other station, and enter "0" to the network No. and value of "logical station number" which set in the MNETH utility to the station number.
(2) When own station is selected in the network setting, network No. "0" and station No. "255" are displayed as the network status.

9.3.5 Setting the device to be monitored

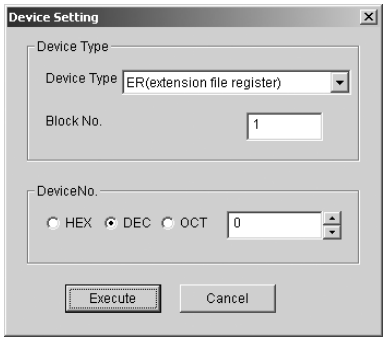
Set the device to be monitored.

(1) Selecting the menu

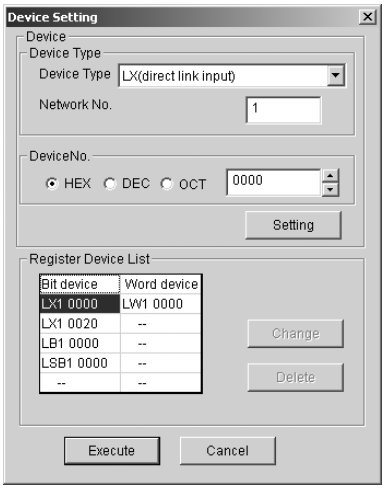
Select [Setting] - [Device setting] from the menu bar.

(2) Dialog box

For batch monitoring



For 16-point entry monitor



Item	Content
Device Type	Set a type of devices to be monitored. • Enter a block number for ER. • Enter a network number for LX, LY, LB, LW, LSB, and LSW. • Enter a value of start I/O number divided by 16 in decimal for SPG.
Device No.	Set the head number of the device to be monitored. (HEX: Hexadecimal, DEC: Decimal, OCT: Octal)
Register Device List	Displays a list of the devices entered.
Setting button	Enters the item set in Device type and Device number, then adds it to List of devices entered.
Change button	Select the device to be changed and click this button to change the entered data.
Delete button	Select the device to be deleted and click this button to delete it from List of devices entered.

POINT

The only devices that may be monitored using the 16-point entry monitor are those that have random access capability. If a device that is not capable of random-access is specified, a device type error (-3) will occur.
Refer to "MELSEC Data Link Library Reference Manual" to determine whether or not a device has random-access capability.

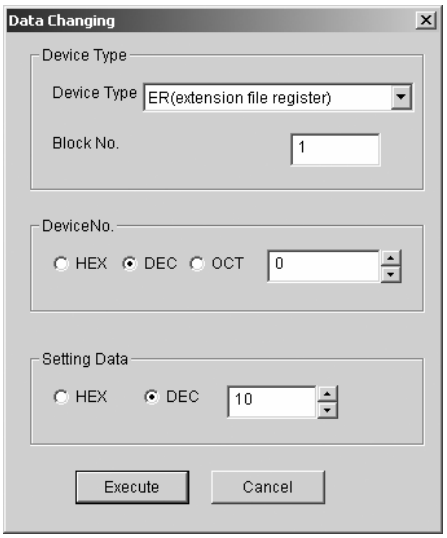
9.3.6 Changing word device values

Changes the specified word device value.

(1) Selecting the menu

Select [Device write] - [Data changing] from the menu bar.

(2) Dialog box



Item	Content
Device Type	Set a type of a device whose value is to be changed. • Enter a block number for ER. • Enter a network number for LW and LSW. • Enter a value of start I/O number divided by 16 in decimal for SPG.
Device No.	Set a number of a device whose value is to be changed. (HEX: Hexadecimal, DEC: Decimal, OCT: Octal)
Setting Data	Enter a value to be changed. (HEX: Hexadecimal, DEC: Decimal)

⚠WARNING

• Configure an interlock circuit in the sequence program so that the entire system works safely at all times for data change control to the programmable controller in operation.
Also, determine corrective actions for an event of data communication error between the PC and programmable controller CPU in use.

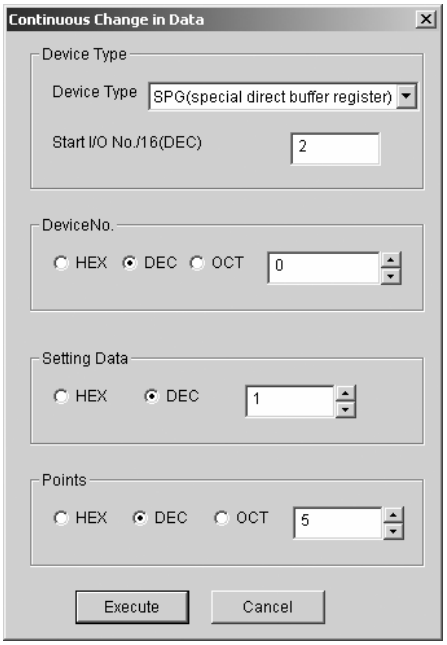
9.3.7 Changing word device values continuously

Change the specified word device value for the number of specified points being set.

(1) Selecting the menu

Select [Device write] - [Continuous Change in Data] from the menu bar.

(2) Dialog box



Item	Content
Device Type	Set a type of a devices whose values are to be changed. • Enter a block number for ER. • Enter a network number for LW and LSW. • Enter a value of start I/O number divided by 16 in decimal for SPG.
Device No.	Set a head address of a device number whose value is to be changed. (HEX: Hexadecimal, DEC: Decimal, OCT: Octal)
Setting Data	Enter a value to be continuously changed. (HEX: Hexadecimal, DEC: Decimal)
Points	Set the number of points to perform continuos change of values. (HEX: Hexadecimal, DEC: Decimal, OCT: Octal)

⚠WARNING

- Configure an interlock circuit in the sequence program so that the entire system works safely at all times for data change control to the programmable controller in operation.
  Also, determine corrective actions for an event of data communication error between the PC and programmable controller CPU in use.

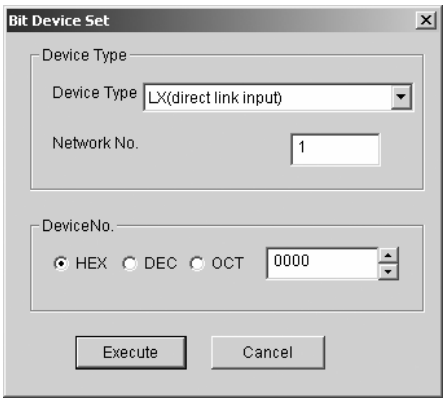
9.3.8 Tuning on/off a bit device

Turns on/off the specified bit device.

(1) Selecting the menu

Select [Device write] - [Bit device set (reset)] from the menu bar.

(2) Dialog box



Item	Content
Device Type	Set a type of a device whose value is to be changed. • Enter a network number for LX, LY, LB and LSB.
Device No.	Set a number of a device whose value is to be changed. (HEX: Hexadecimal, DEC: Decimal, OCT: Octal)

⚠WARNING

- Configure an interlock circuit in the sequence program so that the entire system works safely at all times for data change control to the programmable controller in operation.
  Also, determine corrective actions for an event of data communication error between the PC and programmable controller CPU in use.

9.3.9 Switching the display form

Switches the device monitoring display to the selected form.
The batch monitoring and 16-point entry monitor have different sets of selectable menus, respectively.

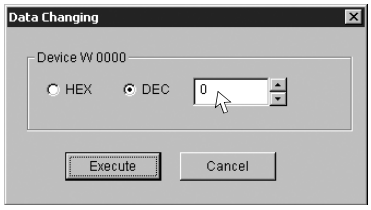
(1) Selecting the menu

Select [Display switch] - [Word (bit) device] from the menu bar.

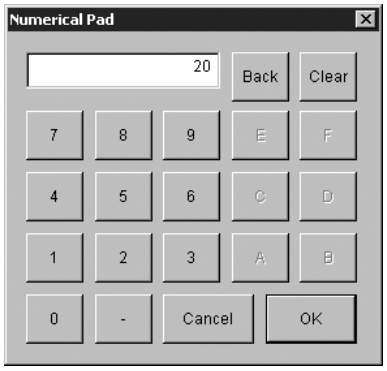
9.3.10 Numeric value input pad

A numeric value input pad is available for setting device values and other numeric parameters. To display the numeric value input pad, select [Options] - [Numerical pad] from the menu bar.

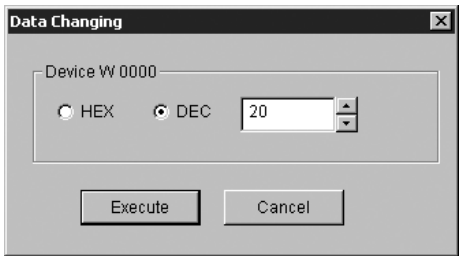
1. Click inside the numeric value input field.



2. The numeric value input pad is displayed. Use the buttons to enter a desired value, and then click the OK button.



3. The value is entered in the system.



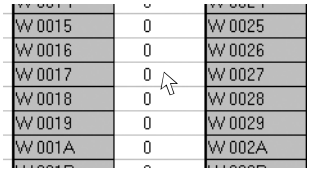
9.3.11 Other operations

Double-clicking the device number on the screen while monitoring changes data in word device and turns on/off the bit device.

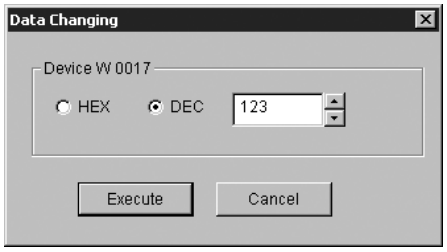
(1) Word device

The following explains how to change the word device.
(Only when the display form is 16 bit.)

1. Double-click the number of the word device to be changed.



2. As the following dialog box is displayed, set a desired value.
   Click the [Execute] button.



3. Select [Yes] in the dialog box shown below if the change is acceptable.
   Select [No] to cancel the operation.

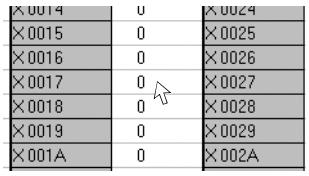
⚠WARNING

- Configure an interlock circuit in the sequence program so that the entire system works safely at all times for data change control to the programmable controller in operation.
  Also, determine corrective actions for an event of data communication error between the PC and programmable controller CPU in use.

(2) Bit device

The following explains how to turn on/off the bit device.
However, this operation is available only when the display orientation is "Portrait."

1. Double-click the number of the bit device to be changed.



2. Select [Yes] in the dialog box shown below if the change is acceptable.
   Select [No] to cancel.

⚠WARNING

- Configure an interlock circuit in the sequence program so that the entire system works safely at all times for data change control to the programmable controller in operation.
  Also, determine corrective actions for an event of data communication error between the PC and programmable controller CPU in use.

10 MELSEC DATA LINK LIBRARY

This chapter describes the functional overview offered by the library.
These functions are used when creating a user program that communicates with a programmable controller CPU. With the functions, the user can perform communication without being conscious of the hardware type on the opposite side or the communication protocol.
The following table lists the MELSEC data link library that is provided with the MELSECNET/H board.

Function name	Description
mdOpen	Opens a communication line.
mdClose	Closes a communication line.
mdSendEx	Batch writes devices. (Extended function ＊1)
mdReceiveEx	Batch reads devices. (Extended function ＊1)
mdRandWEx	Writes devices randomly. (Extended function ＊1)
mdRandREx	Reads devices randomly. (Extended function ＊1)
mdDevSetEx	Sets a bit device. (Extended function ＊1)
mdDevRstEx	Resets a bit device. (Extended function ＊1)
mdTypeRead	Reads the type of programmable controller CPU.
mdControl	Remote operation of programmable controller CPU. (RUN/STOP/PAUSE).
mdBdRst	Resets the board.
mdBdModSet	Sets the mode of the board.
mdBdModRead	Reads the mode of the board.
mdBdLedRead	Reads the LED information of the board.
mdBdSwRead	Reads the switch status of the board.
mdBdVerRead	Reads the version information of the board.
mdInit	Initializes programmable controller information table.
mdSend	Batch writes devices.
	Sends data (SEND function).
mdReceive	Batch reads devices.
	Receives data (RECV function).
mdRandW	Writes devices randomly.
mdRandR	Reads devices randomly.
mdDevSet	Sets a bit device.

＊1 : A function in which the access range is extended according to the extension of the device points at the access target. It is accessible to all device numbers. Use extended functions when creating a new program.

POINT

Refer to "MELSEC Data Link Library Reference Manual" for the details of the functions.

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MEMO

11 PROGRAMMING

11.1 Cautions in Programming

This section explains concerning cautions in the case that a program is created using data on a network.

11.1.1 Interlock related signals

Show a list of the interlock signal devices used in the user program.
For other hosts and other stations, refer to the "Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)" about the operating status and setting status, etc.

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Assignment of link special relays (SB) and link special registers (SW) when multiple boards are installed

Device	Name	Description	Device status	
			Off (0)	On (1)
SB20	Module status	Indicates the communication status between MELSECNET/H board and personal computer.	Normal	Abnormal
SB47	Baton pass status of host	Indicates the baton pass status of the host. It is in a status that the cyclic transmission and transient transmission can be performed when it is normal.	Normal (Data link enabled)	Abnormal (Host disconnected)
SB49	Data link status of host	Indicates the data link status (cyclic transmission status) of the host.	Data link being executed (Executing cyclic transmission)	Data link being stopped (Set after refresh completion)
SB70	Baton pass status of each station	Indicates the baton pass status of each station (including the host). Reserved stations and stations having numbers higher than the maximum station number are not included. This device turns off when SW70 to 73 are all "0".	All stations normal	One or more stations are abnormal
SB74	Data link status of each station	Indicates the data link (cyclic transmission) status of each station (including the host). Reserved stations and stations having numbers higher than the maximum stations number are not included. This device turns off when SW74 to 77 are all "0".	All stations executing data link (All stations executing cyclic transmission)	One or more stations are not executing data link
SW70 to 73	Baton pass status of each station (per station number)	Stores the baton pass status of each station (including the host). Numbers 1 to 64 in the table denote station numbers.	Baton pass normal (including reserved stations during online and stations having numbers higher than the maximum station number)	Baton pass abnormal (including reserved stations during offline test and stations having numbers higher than the maximum station number)
SW74 to 77	Data link status of each station (per station number)	Stores the data link (cyclic transmission) status of each station. (Including the host) Numbers 1 to 64 in the table denote station numbers.	Executing data link (including reserved stations and stations having numbers higher than the maximum station number)	Station not executing data link

	b15	b14	b13	b12	to	b4	b3	b2	b1	b0
SW70	16	15	14	13	to	5	4	3	2	1
SW71	32	31	30	29	to	21	20	19	18	17
SW72	48	47	46	45	to	37	36	35	34	33
SW73	64	63	62	61	to	53	52	51	50	49

	b15	b14	b13	b12	to	b4	b3	b2	b1	b0
SW74	16	15	14	13	to	5	4	3	2	1
SW75	32	31	30	29	to	21	20	19	18	17
SW76	48	47	46	45	to	37	36	35	34	33
SW77	64	63	62	61	to	53	52	51	50	49

11.2 Cyclic Transmission

The link scan of the MELSECNET/H and the programmable controller of the user program operate asynchronously.
Depending on the timing of the user program execution, link data with data types of more than 32 bits (two words), such as the ones below, may be broken up into new and old data, which may coexist in 16 bit (one word) units.

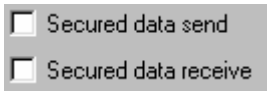
- Floating point data
- Current values of positioning module, command speed.

The MELSECNET/H provides the following functions for making handling of the link data easy.

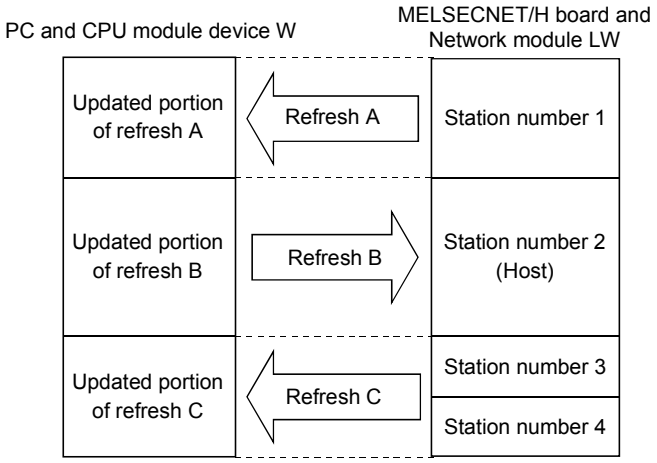
- 32 bit data guarantee (Refer to "Q corresponding MELSECNET/H network system reference manual (PLC to PLC network)" for details.)
- Block guarantee of cyclic data per station (Refer to Section 11.2.1 Block guarantee of cyclic data per station for details)

11.2.1 Block guarantee of cyclic data per station

By enabling the parameter settings shown below, handshaking for the cyclic data is performed between the PC and the MELSECNET/H board and then the network is refreshed.
Through the cyclic data handshaking, the link data block is guaranteed for each station (to prevent link data separation per station ＊1).
As shown below, set the send and receive parameters as needed.
The MELSECNET/H board can be set in the MNETH utility's "Common Parameter Setting (Supplementary Settings)" screen only when it is the control station. (It is not necessary to set it if the board is a normal station.)



By selecting both [Secured data send] and [Secured data receive], an interlock for the link data between the stations to be set becomes unnecessary.



POINT

The block guarantee per station applies only to the refresh processing. To use the direct access of the link devices, the programs should be interlocked.

＊1: The separation prevention refers to a prevention of link data with double word precision (32 bits), such as the current value of the positioning module, from being separated into new data and old data in one word (16 bits) units due to the cyclic transmission timing.

11.3 Link Special Relays (SB)/Registers (SW)

The data linking information is stored in the link special relays (SB)/registers (SW). They can be used by the user program, or used for investigating faulty areas and the causes of errors by monitoring them.
The following table shows which SB and SW can be used to check which information. For more details, refer to "Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)".

(1) To know the information about the host

Item	SB	SW
Personal computer status of the host (normal/abnormal)	SB004A$_H$ SB004B$_H$	SW004B$_H$
The external power supply status of the host	SB0042$_H$	—
Communication status between MELSECNET/H board and personal computer.	SB0020$_H$	SW0020$_H$
Setting status of the MELSECNET/H board	SB0040$_H$ to 44$_H$ SB0058$_H$ to 69$_H$	SW0040$_H$ to 46$_H$ SW0054$_H$ to 68$_H$
Running status of the MELSECNET/H board	SB0047$_H$ to 49$_H$	SW0047$_H$ to 4A$_H$

(2) To know information about the entire network

Item	SB	SW
CPU and personal computer status of each station (normal/abnormal)	SB0080$_H$ SB0088$_H$	SW0080$_H$ to 83$_H$ SW0088$_H$ to 8B$_H$
CPU and personal computer operation status of each station (RUN/STOP)	SB0084$_H$	SW0084$_H$ to 87$_H$
Cyclic transmission status of each station	SB0074$_H$	SW0074$_H$ to 77$_H$
The external power supply status of each station	SB008C$_H$	SW008C$_H$ to 8F$_H$
Link scan, communication mode	SB0068$_H$ SB0069$_H$	SW0068$_H$ to 6D$_H$
Setting information of the network	SB0054$_H$ to 69$_H$	SW0054$_H$ to 68$_H$
Running information of the network	SB0070$_H$	SW0070$_H$ to 73$_H$
Line status	SB0090$_H$ to 9A$_H$	SW0090$_H$ to 9F$_H$

(3) To know redundant CPU system information

Item	SB	SW
Operating mode of redundant CPU	SB01F4$_H$	SW01F4$_H$ to 1F7$_H$
Pairing setting of each station	SB01F8$_H$	SW01F8$_H$ to 1FB$_H$
System status in redundant CPU system	SB01FC$_H$	SW01FC$_H$ to 1FF$_H$

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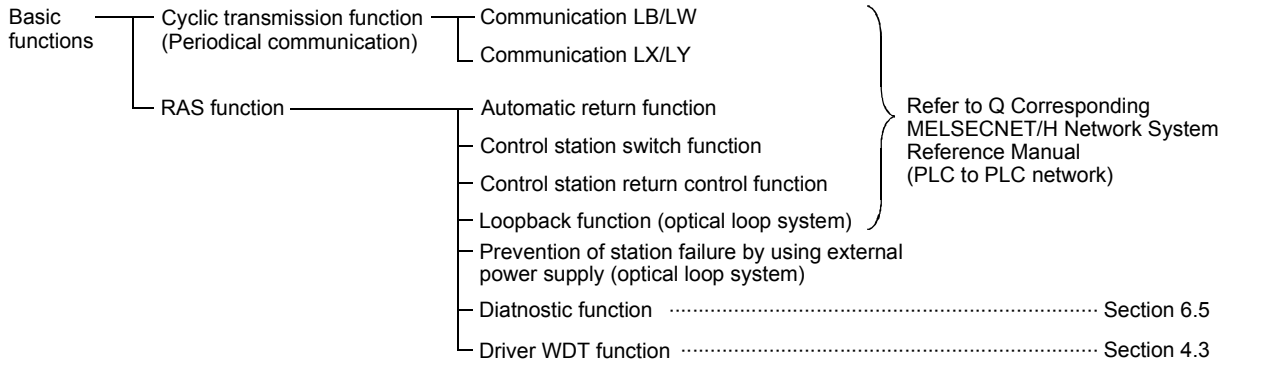
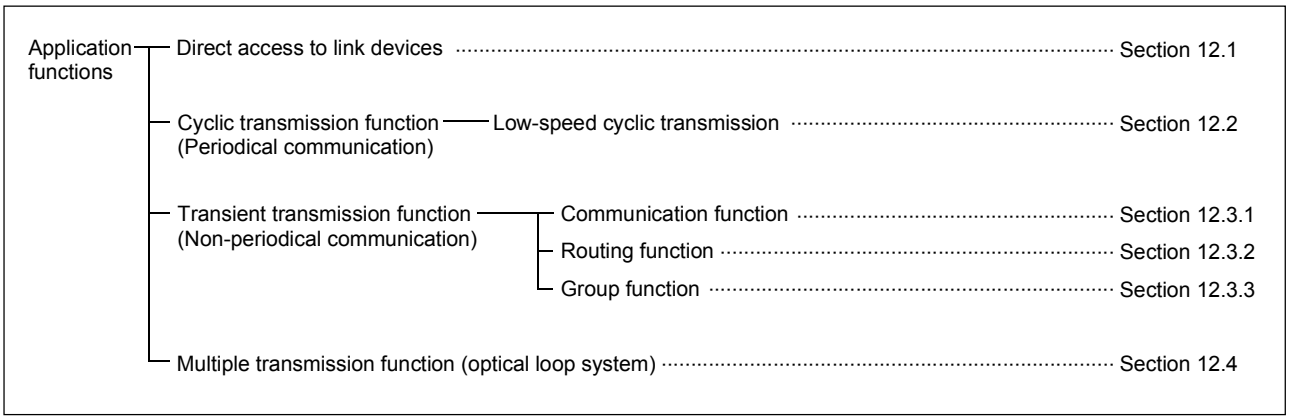
12 APPLICATION FUNCTIONS


Basic functions
Cyclic transmission function (Periodical communication)
Communication LB/LW
Communication LX/LY
RAS function
Automatic return function
Control station switch function
Control station return control function
Loopback function (optical loop system)
Prevention of station failure by using external power supply (optical loop system)
Diatnostic function ····· Section 6.5
Driver WDT function ····· Section 4.3
Refer to Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)


Application functions
Direct access to link devices ····· Section 12.1
Cyclic transmission function (Periodical communication)
Low-speed cyclic transmission ····· Section 12.2
Transient transmission function (Non-periodical communication)
Communication function ····· Section 12.3.1
Routing function ····· Section 12.3.2
Group function ····· Section 12.3.3
Multiple transmission function (optical loop system) ····· Section 12.4

12.1 Direct Access to the Link Devices

The link devices (LB, LW, LX, LY, SB, SW) of the MELSECNET/H board can be directly read from/written to the user program by the driver setting.
By directly accessing the link devices, the link refresh time and the transmission delay time can be shortened.
However, in direct access, since block guarantees are not applicable in station units, it is necessary to establish an interlock.
For the direct access setting, set it in the "Driver" in the MNETH utility.

POINT
The direct access of the link devices LX/LY is limited to the communication with the block I/O master station set with the common parameters. By limiting the communication, data cannot be shared among multiple stations, such as link device LB/LW, but 1:1 communication between predefined stations is allowed.

12.2 Low-Speed Cyclic Transmission Function

POINT

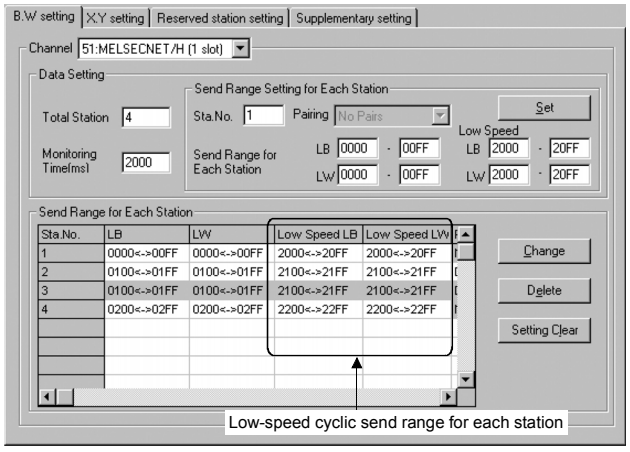
The Q00J/Q00/Q01CPU does not support the low-speed cyclic transmission function. Therefore, the low-speed cyclic transmission function cannot be used in MELSECNET/H that connects the Q00J/Q00/Q01CPU.

The low-speed cyclic transmission function is convenient when sending data that does not require high-speed transfer to other stations in a batch mode using the cyclic devices (LB/LW).

A station can transmit data only once in a single link scan. Simultaneous data transmission from multiple stations requires more scan time than the following:

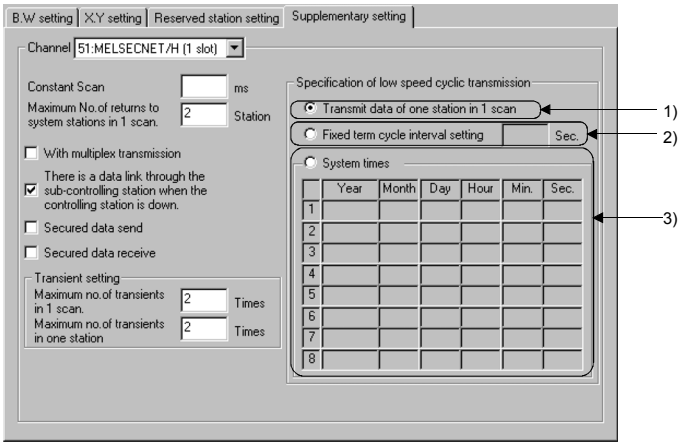
Low-speed cyclic link scan time = normal link scan time × (number of send stations + 1)

In the low-speed cyclic transmission, send range for each station is set with the "Common parameters setting (B, W setting)" screen of the MNETH utility.



The sending to other stations can be activated by three methods: 1): "Transmit data of one station in 1 scan", 2): "Fixed term cycle interval setting", and 3):" System times" and those three method are set in the "Common parameter setting" screen (bus setting).

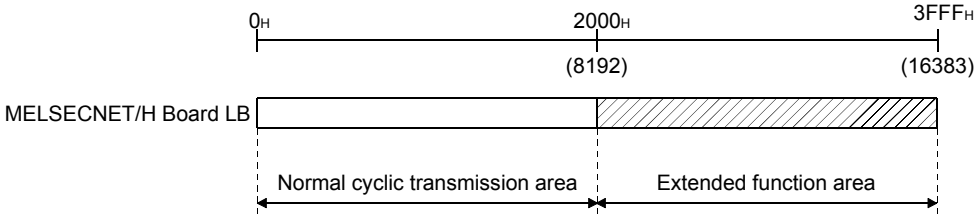
Only one of them can be selected.



12.2.1 Send range settings

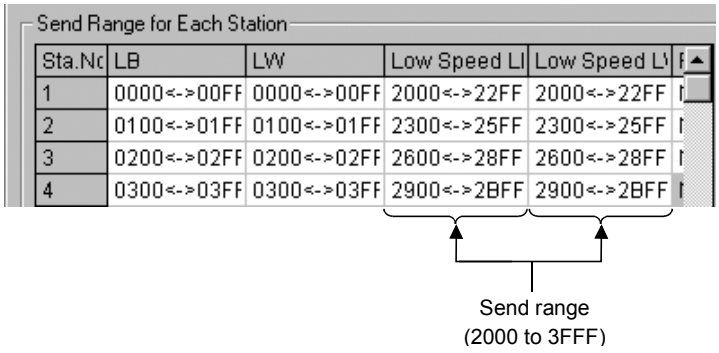
Each station's send range of link devices (low-speed LB, low-speed LW) is assigned to the extended area (2000 to 3FFF) in 16-point units for LB (start : ☐☐☐0 to end ☐☐☐F) and in one-point units for LW.
Each station's send range can also be assigned using a random station number assignment sequence.

(1) Device range



(2) Screen settings

This shows in the case where 768 points of the transmission range for each station is assigned to (Low Speed LB, Low Speed LW) in the "Common parameter setting (B, W Setting)" screen in the MNETH utility.



POINT

(1) The total of the send ranges per station must not exceed 2000 bytes in the low-speed cyclic transmission. (The send range for the normal cyclic transmission is not included.)
(2) The LX and LY cannot be set as low-speed cyclic devices.
(3) Low-speed cyclic transmission function cannot be used during MELSECNET/10 mode.

12.2.2 Send timing

The low-speed cyclic transmission is executed separately from the normal cyclic transmission. This section describes the setting, processing interval and link cycle of the low-speed cyclic transmission.

(1) Transmission setting

The link cycle of the low-speed cyclic transmission varies depending on its transmission setting.

The setting can be made at "Specification of low speed cyclic transmission" on "Supplementary setting". (Refer to Section 12.3.1.)

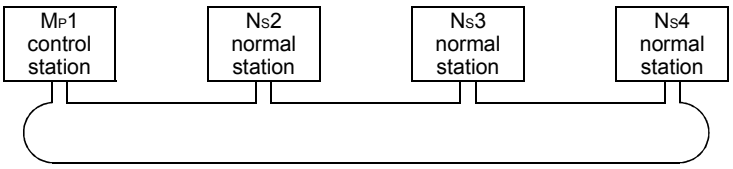
The following lists the setting options.

Setting item	Description
Transmit data of one station in 1 link scan	Low-speed cyclic data of max. one station are sent during one link scan of normal cyclic transmission.
Fixed term cycle interval setting	Low-speed cyclic data are sent at a specified time interval. ＊1
System times	Low-speed cyclic data are sent at a specified time. ＊1

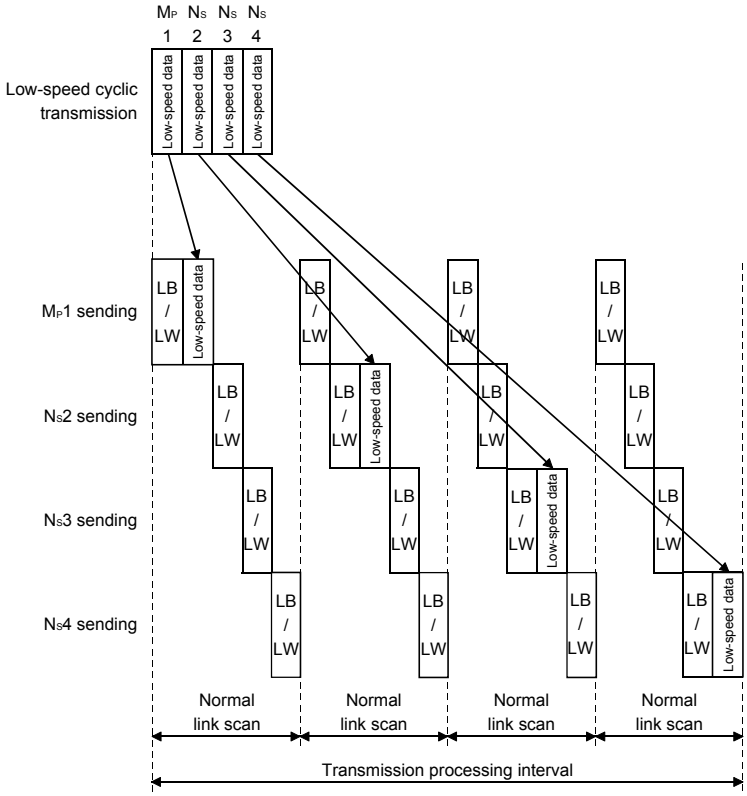
＊1: Maximum no. of stations capable of sending data during 1 link scan of normal cyclic transmission varies depending on the "Maximum no. of transients in 1 scan" setting.
Refer to Section 12.3.1 for the "Maximum no. of transients in 1 scan" setting.

(2) Transmission processing interval

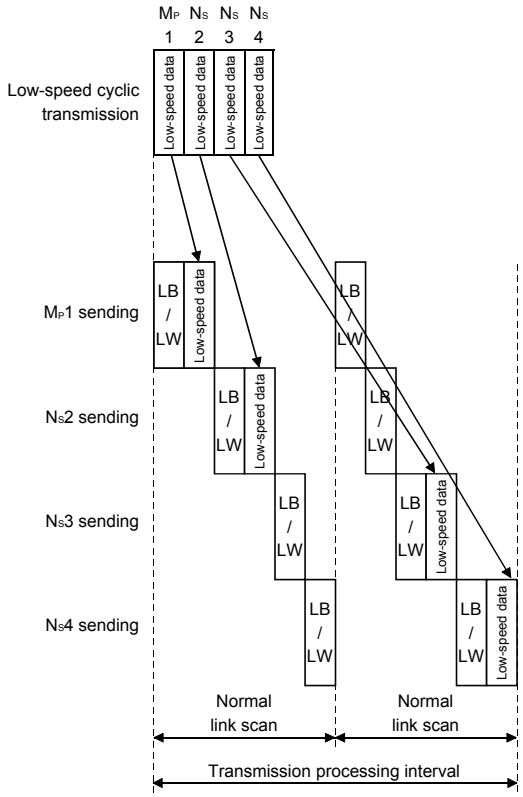
The following system configuration example is used for subsequent explanations.



(a) When "Transmit data of one station in 1 link scan", "Fixed term cycle interval setting (Maximum no. of transients: 1)" and "System times (Maximum no. of transients: 1)" are set



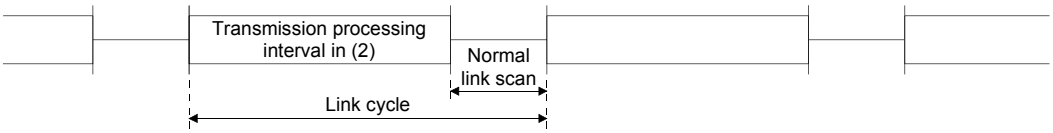
(b) When "Fixed term cycle interval (Maximum no. of transients: 2)" and "System times (Maximum no. of transients: 2)" are set



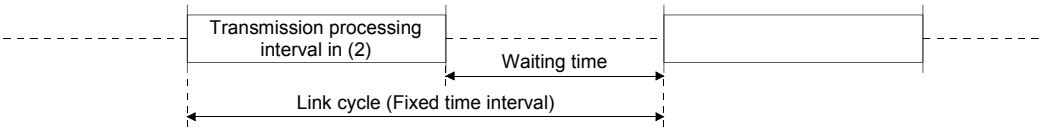
(3) Link cycle

Link cycle examples of the low-speed transmission are as shown below.

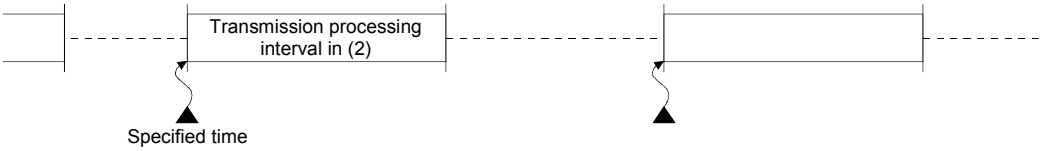
(a) When "Transmit data of one station in 1 link scan" is set



(b) When "Fixed term cycle interval setting" is set



(c) When "System times" is set



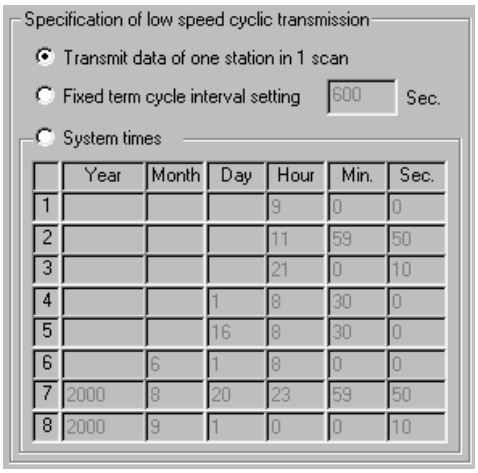
12.2.3 Startup

(1) Sending of data for one station per link scan (default)

The low-speed cyclic data for a maximum of one station is sent in one link scan of the normal cyclic transmission.

[Setting method]

1) Click (◉) "Transmit data of one station in 1 scan" to select.


Specification of low speed cyclic transmission
Transmit data of one station in 1 scan
Fixed term cycle interval setting
600
Sec.
System times
Year Month Day Hour Min. Sec.
1 9 0 0
2 11 59 50
3 21 0 10
4 1 8 30 0
5 16 8 30 0
6 6 1 8 0 0
7 2000 8 20 23 59 50
8 2000 9 1 0 0 10

POINT

The fastest link scan time in the low-speed cyclic transmission can be calculated by the following equation:

LS_L = LS × number of stations + LS
= LS × (number of stations + 1)

LS_L : The fastest link scan time in the low-speed cyclic transmission

LS : Normal link scan time

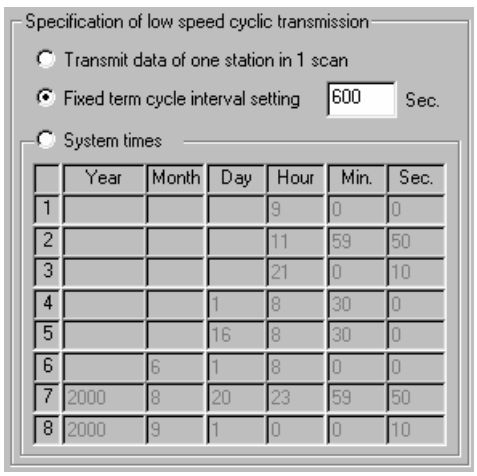
(2) Fixed term cycle interval setting

The low-speed cyclic data is sent in the link cycle of the designated time frequency.

Valid setting frequency: 1 to 65535 s (18 h, 12 min and 15 s)

[Setting method]

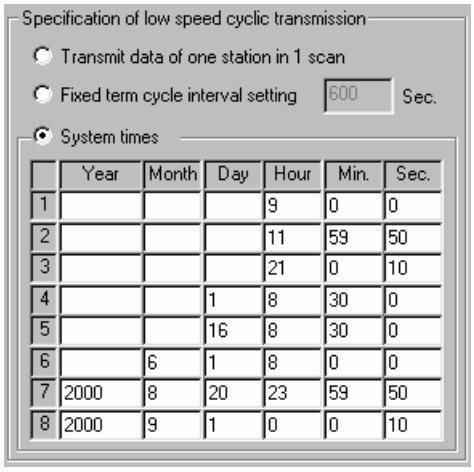
1) Click (◉)"Fixed term cycle interval setting" to select.
2) Set the time in seconds (the screen shows a value of 600).


Specification of low speed cyclic transmission
Transmit data of one station in 1 scan
Fixed term cycle interval setting
600
Sec.
System times
Year Month Day Hour Min. Sec.
1 9 0 0
2 11 59 50
3 21 0 10
4 1 8 30 0
5 16 8 30 0
6 6 1 8 0 0
7 2000 8 20 23 59 50
8 2000 9 1 0 0 10

(3) System timer interval

The low-speed cyclic data are sent in the link cycle at the designated time.
By omitting year, month, and day in the setting, the low-speed cycle transmission can be activated yearly (or monthly, or daily). Hour, minute and second values must be entered.
Setting points: 1 to 8 points
[Setting method]

1) Click (◉)"System times" to select.
2) Set year, month, day, hour, minute and second to the designated time.
   In the following screen example:
   Points 1 to 3 : By omitting year, month and day, data is sent every day at the designated time.
   Points 4 and 5 : By omitting year and month, data is sent at the designated time monthly.
   Point 6 : By omitting the year, data is sent at the designated time every year.
   Points 7 and 8 : Data is sent only once at the designated time.



	Year	Month	Day	Hour	Min.	Sec.
1				9	0	0
2				11	59	50
3				21	0	10
4			1	8	30	0
5			16	8	30	0
6		6	1	8	0	0
7	2000	8	20	23	59	50
8	2000	9	1	0	0	10

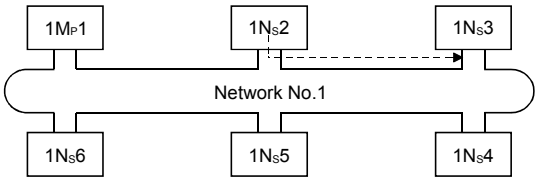
POINT

(1) The system timer operates based on the host's clock.
If used without matching the clocks on the sending station and receiving station, there may be a time gap between the stations.
(2) When handling multiple data without the block guarantee per station function, new and old data may coexist.
Apply interlocks to prevent the coexistense.

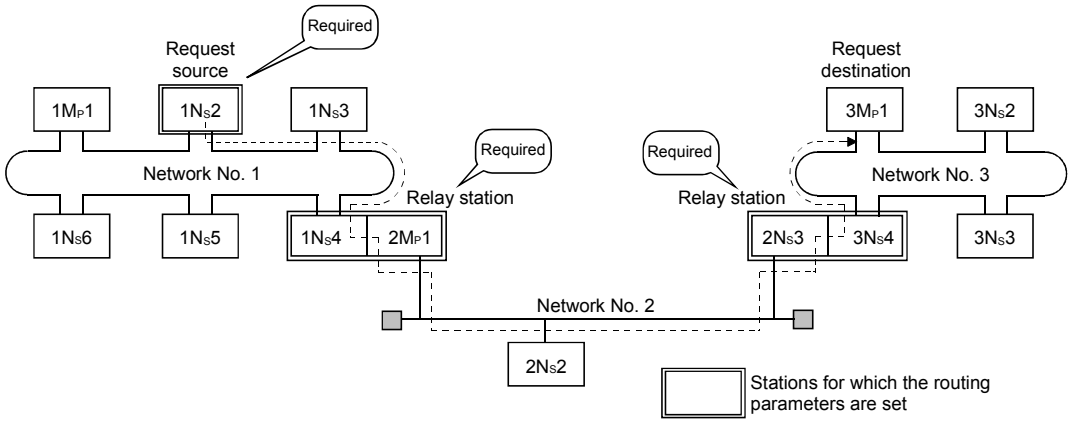
12.3 Transient Transmission Function

The transient transmission function performs data communication only when it is requested between stations.
In the MELSECNET/H, data communication can be performed with other stations having the same network number (the same network as where the host is connected), as well as with stations having other network numbers.

1) Transient transmission function to a station on the same network



2) Transient transmission to stations on other networks (routing function)
In this case, the routing parameters must be set for the request source and relay stations.



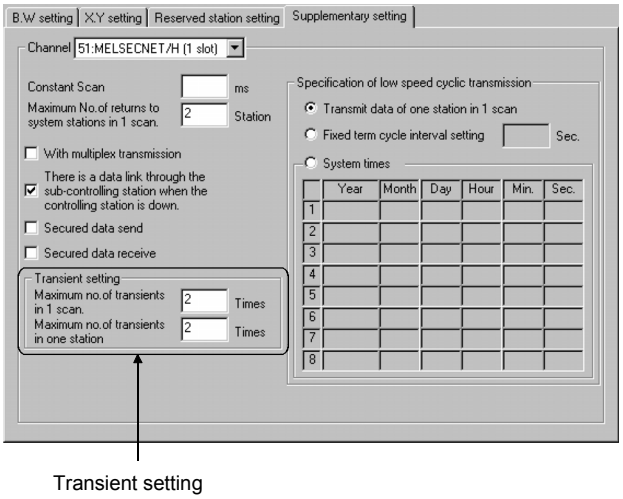
12.3.1 Communication function

(1) Parameter settings

Set the execution conditions for the transient transmission with the parameters listed below.

In the default settings, both the number of transients that one network can execute in one link scan ("Maximum no. of transients in 1 scan") and the number of transients that one station can execute in one link scan ("Maximum no. of transients in one station") are set to 2 times. Change the number of transients that can be executed in a link scan as necessary (Refer to Points below).

Setting item \ Setting value	Valid setting times	Default setting
Maximum no. of transients in 1 scan	1 to 255 times	Twice
Maximum no. of transients in one station	1 to 10 times	Twice



POINT

(1) By increasing the number of transients, multiple transient instructions can be executed at the same time (in one link scan).

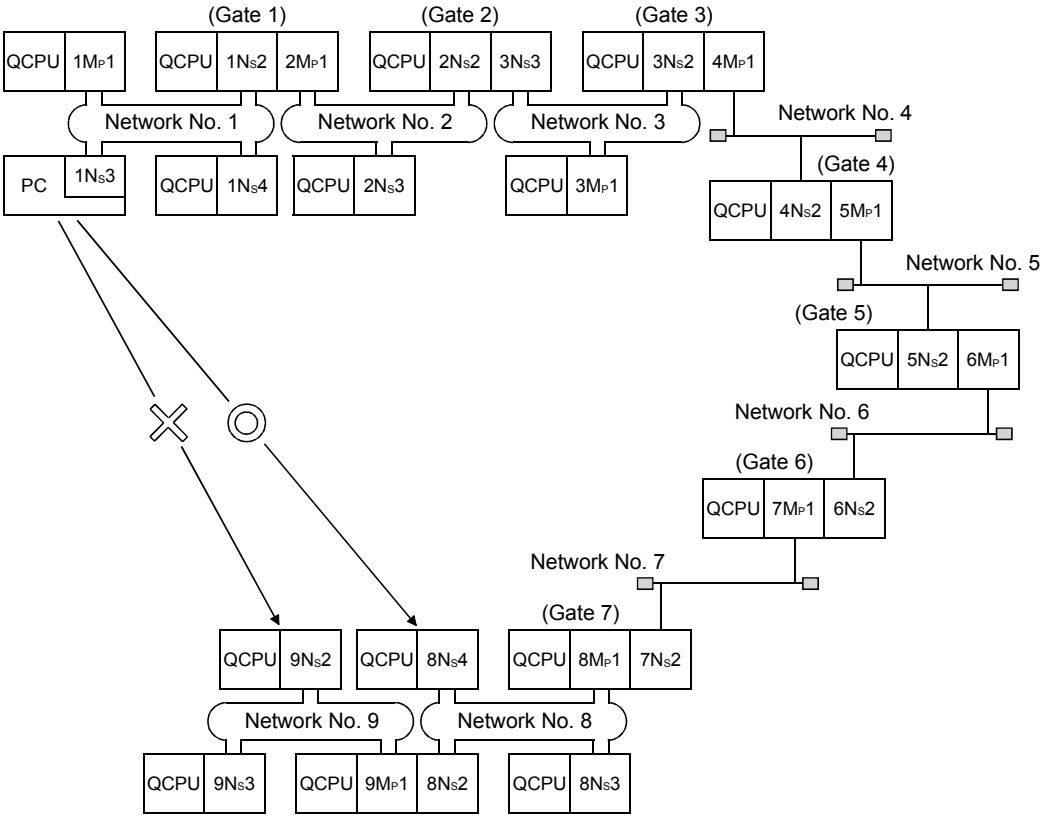
(2) If the number of transients is increased and the transient request was issued in each station at the same time, the link scan time becomes temporarily longer and the cyclic transmission is also affected. Do no set unnecessarily large values.

(3) When the transient transmission and the low-speed cyclic transmission are used at the same time, these transient setting parameters limit the total number of transient and low-speed cyclic transmissions.

(2) Transient transmission range

In a multiple network system of the MELSECNET/H, communication can be performed with stations in a maximum of eight networks by setting the routing parameters described in Section 12.3.2.

The following diagram illustrates the transient transmission range using an example where the destinations are limited to eight networks.



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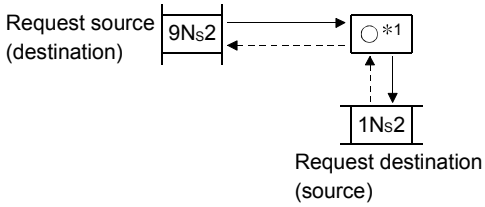
[Transient transmission valid range]

The following table shows the valid ranges of send/receive by transient transmission using the network configuration on the previous page.

In the table below, ◎, ○, and × indicate whether or not the transient transmission between the request source (destination) listed in the column at the left and the request destination (source) listed in the row at the bottom is possible.

For example, the valid range between 9NS2 of network number 9 and 1NS2 of network number 1 is indicated by ○ *1 (communication is possible by designating a network module that is close to the request source of the same programmable controller).



◎: Possible

○: Possible by setting the routing parameter

×: Not possible

*1: Communication is possible by designating a network module that is close to the request source of the same programmable controller

Network No. 1	1MP1	Host																						
	1NS2	◎	Host																					
	1NS3	◎	◎	Host																				
	1NS4	◎	◎	◎	Host																			
Network No. 2	2MP1	◎	Host	◎	◎	Host																		
	2NS2	○	◎*1	○	○	◎	Host																	
	2NS3	○	◎*1	○	○	◎	◎	Host																
Network No. 3	3MP1	○	○	○	○	○	◎*1	○	Host															
	3NS2	○	○	○	○	○	◎*1	○	◎	Host														
	3NS3	○	○	○	○	◎	Host	◎	◎	◎	Host													
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮													
Network No. 8	8MP1	○	○	○	○	○	○	○	○	○	○	·····	Host											
	8NS2	○	○	○	○	○	○	○	○	○	○	·····	◎	Host										
	8NS3	○	○	○	○	○	○	○	○	○	○	·····	◎	◎	Host									
	8NS4	○	○	○	○	○	○	○	○	○	○	·····	◎	◎	◎	Host								
Network No. 9	9MP1	○	○	○	○	○	○	○	○	○	○	·····	◎	Host	◎	◎	Host							
	9NS2	×	○*1	×	×	○	○	○	○	○	○	·····	○	◎*1	○	○	◎	Host						
	9NS3	×	○*1	×	×	○	○	○	○	○	○	·····	○	◎*1	○	○	◎	◎	Host					
Request source (destination) / Request destination (source)		1MP1	1NS2	1NS3	1NS4	2MP1	2NS2	2NS3	3MP1	3NS2	3NS3	·····	8MP1	8NS2	8NS3	8NS4	9MP1	9NS2	9NS3						
		Network No. 1				Network No. 2			Network No. 3			·····	Network No. 8				Network No. 9								

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12.3.2 Routing function

The routing function is used to execute transient transmissions to stations having other network numbers in a multiple network system.
In order to execute the routing function, it is necessary to set the "routing parameters" to associate the network numbers of the request source and the station that will function as a bridge*1 between the networks.

*1: The bridge function refers to sending data via an adjacent network.

POINT
MELSECNET/H board cannot be used as a relay station that function as a bridge. Use the network module for the relay station.

(1) Stations that require routing parameter setting

(a) The setting is required for both the transient transmission request source and relay stations.

(b) For the relay stations, two routing settings are required: one from the request source to the request destination, and the other from the request destination back to the request source.

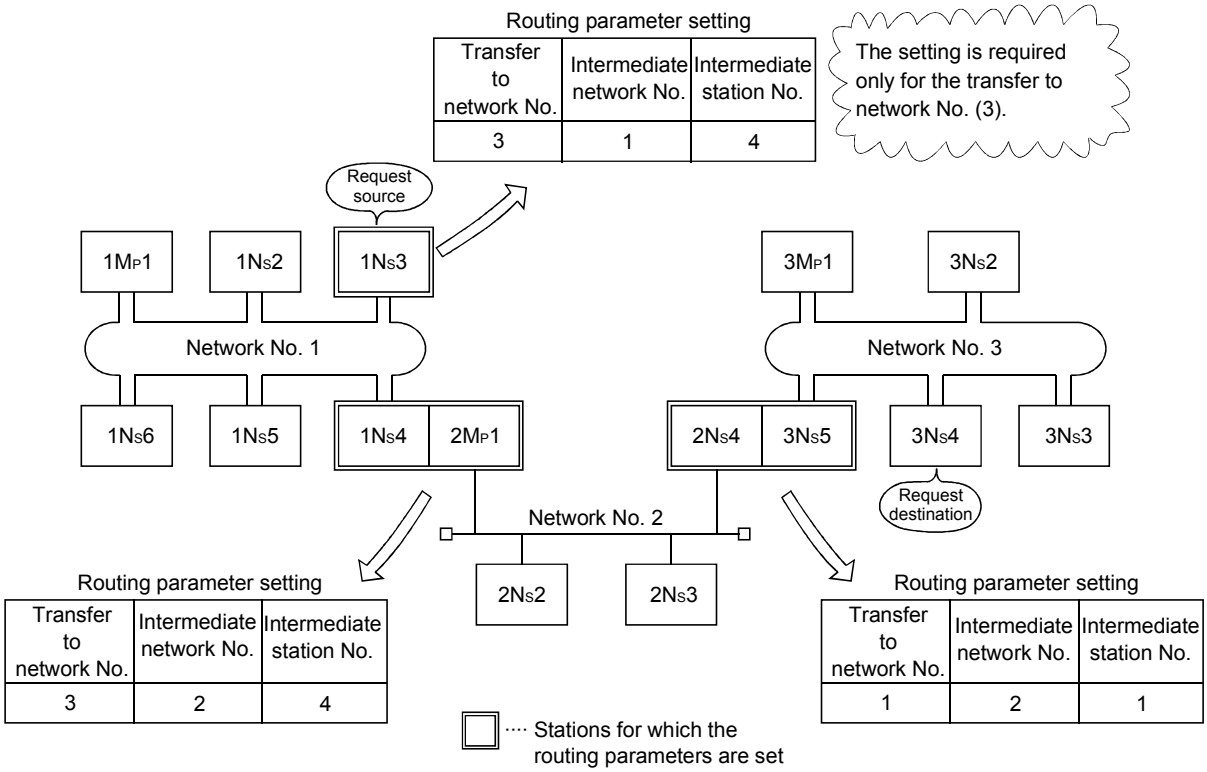
(c) The setting is not required for the request destination.

In the example shown in the diagram below where the transient transmission is executed from 1Ns3 to 3Ns4, the setting is required for the following three stations:

1) Setting for 1Ns3 that requests the transient transmission
Designate the network number (3) of the Transfer to, the relay station (1Ns4), and the relay network number (1) to the relay station.

2) Setting for 1Ns4 that functions as a bridge
Designate the network number (3) of the Transfer to, the relay station (2Ns4), and the relay network number (2) to the relay station. It is not necessary to set the return route because it is designated in the setting for 2Ns4.

3) Setting for 2NS4 that function as a bridge
It is not necessary to set the routing to the Transfer to because the host is on the same network as the destination transfer (3). However, it is necessary to set the Transfer from network number (1) as the Transfer to network number and to designate the relay station (2MP1) and the relay network number (2) to the relay station in order to trace a route back to the request source.



∗1: The bridge function refers to sending data via an adjacent network.

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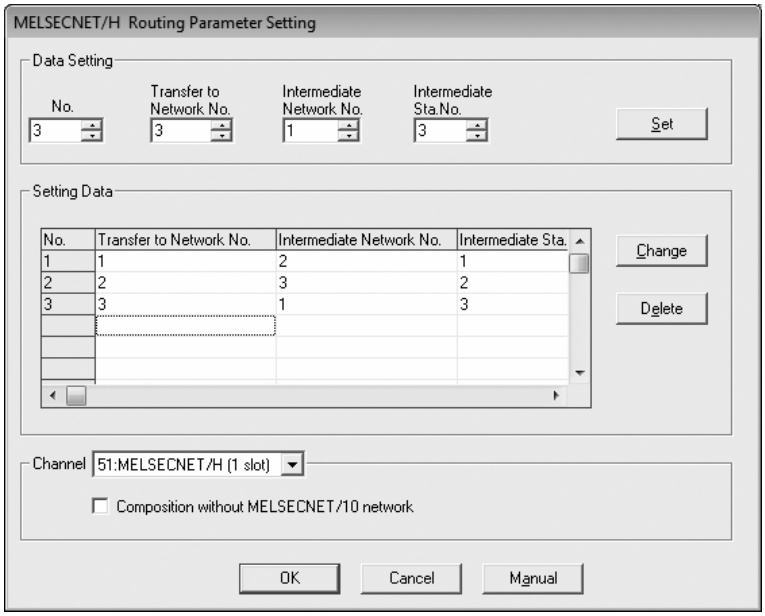
(2) Routing parameter settings

(a) Setting screen

A maximum of 64 "Transfer to Network No." can be set on the "Routing Parameter Setting" of the MNETH utility.

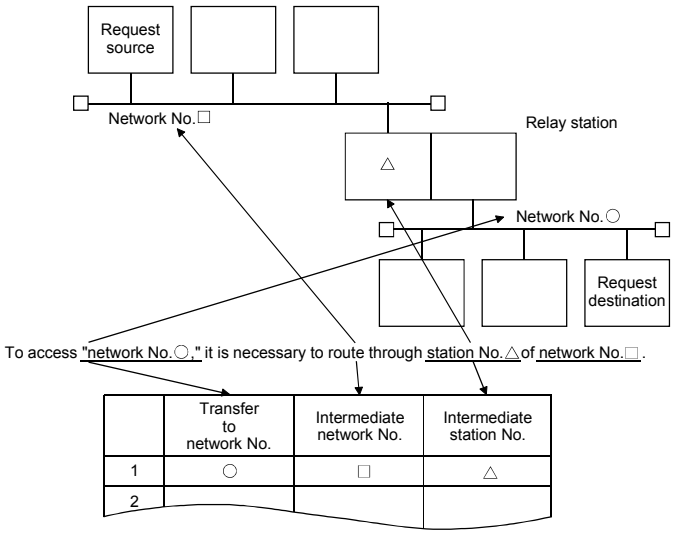
Note that the same Transfer to network number cannot be designated more than once (multiple). Therefore, the host can become the request source or can be accessed to other station through the host with 64 types of different "Transfer to Network No."

Setting item	Valid setting range
Transfer to Network No.	1 to 239
Intermediate Network No.	1 to 239
Intermediate Station No.	1 to 64



(b) Setting method

Set the routing parameters according to the procedure described below.

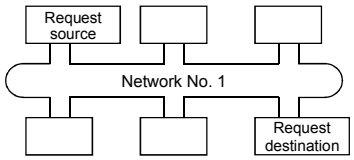


(3) Settings for different network system configurations and setting contents

The stations to set for the transient transmission and the contents of the routing parameters vary depending on the system configuration.

(a) Single network system

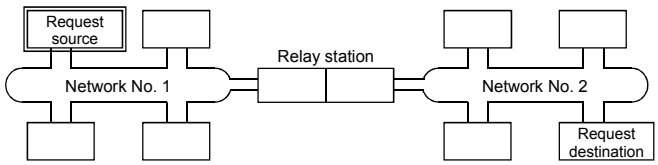
It is not necessary to set the routing parameters for the transient transmission to the same network.



(b) Multiple network system: two networks

Set the routing parameters only for the request source station.

The route for reaching the request destination (network number 2) must be set for the request source station.



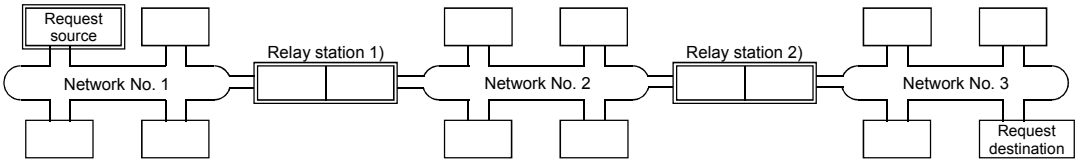
(c) Multiple network system: three networks

Set the routing parameters for the request source and the relay stations.

The route for reaching the request destination (network number 3) must be set for the request source.

The route for reaching the request destination (network number 3) must be set for relay station 1).

The route for reaching the request source (network number 1) must be set for relay station 2).



(d) Multiple network system: four networks

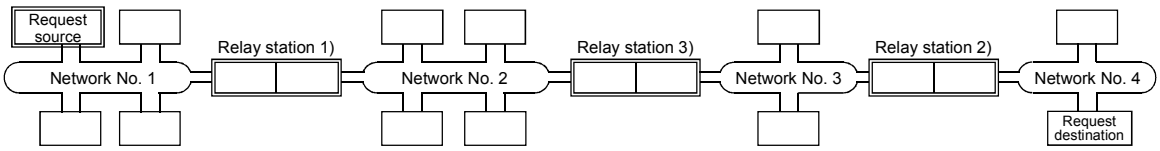
Set the routing parameters for the request source station and the relay stations.

The route for reaching the request destination (network number 4) must be set for the request source station.

The route for reaching the request destination (network number 4) must be set for relay station 1) (the relay station that is closest to the request source).

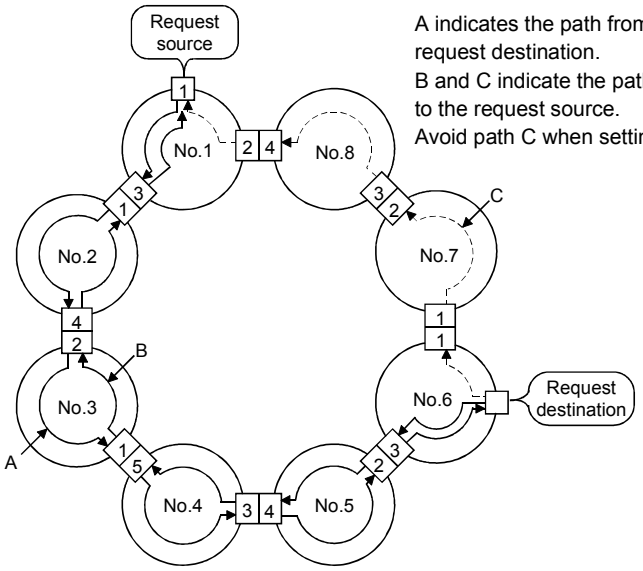
The route for reaching the request source (network number 1) must be set for relay station 2) (the relay station that is closest to the request destination).

The routes for reaching the request destination (network 4) and the request source (network number 1) must be set for relay station 3) (relay station other than 1) and 2)).



POINT

(1) When a network is connected in a loop as shown in the figure below, make sure to set the routing parameters so that the same relay station is routed for both the "route from request source to request designation" and the "route back from request destination to request source."
Do not set the destination and returning paths to circle the entire loop. The first relay station in the return path from the request destination is determined by the relay station in the forward path; thus, data cannot be transferred to a station beyond that relay station and an error occurs.



(2) When data is sent to a remote network by transient transmission using the routing parameters, data is transferred through many networks; thus, the amount of transmission data and the number of transmissions may affect the entire system.
For example, in network No. 2 to 5 in the figure above, the link scan time may become temporarily longer and there may be delays in the transient transmission of the host because of the transient transmissions from other networks.
When using the routing parameters, design the transient transmission by considering the entire system.

(3) When multiple network systems are connected with the routing function, the request source can send requests to destinations in up to eight network systems (the maximum number of relay stations is seven stations).

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(4) Calculation of transmission delay time

The processing time of the transient transmission instruction to access a station on other network in a multiple network system can be obtained by adding the following transmission delay factors.

(Routing transmission delay time) = (processing time from request source to relay station)
+ (processing time from relay station to request destination)

(a) Processing time from request source to relay station

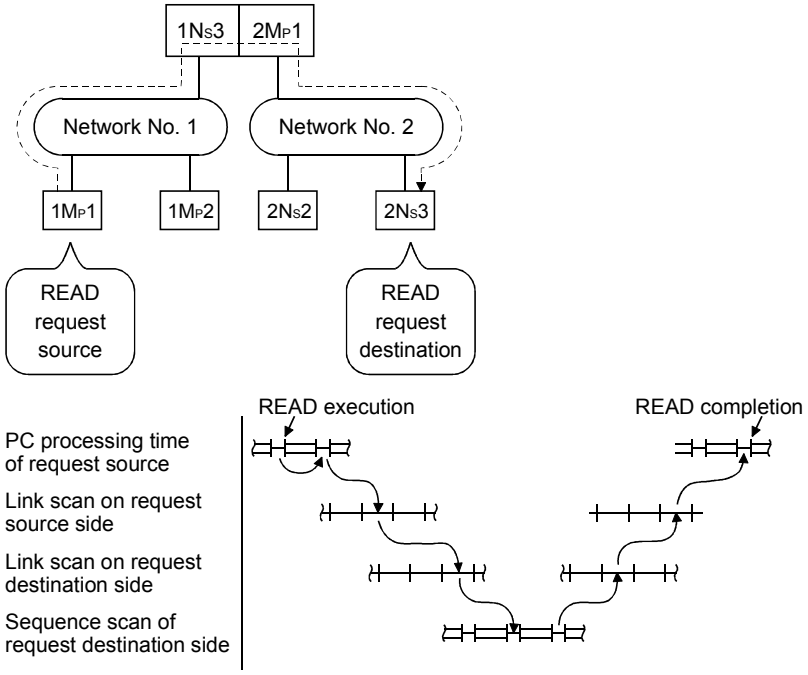
This is the transmission delay time from the request source (the station that executed the instruction) to the relay station that performs the routing. In the following example, it is the time required for the data to be transmitted from station 1MP1 to station 1NS3.

Refer to "Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)" for the calculation of translation of delay time.

(b) Processing time from relay station to request destination

This is the transmission delay time from the relay station to the request destination (the station accessed with the instruction). In the following example, it is the time required for the data to be transmitted from station 2MP1 to station 2NS3.

Refer to "Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)" for the calculation of translation of delay time.

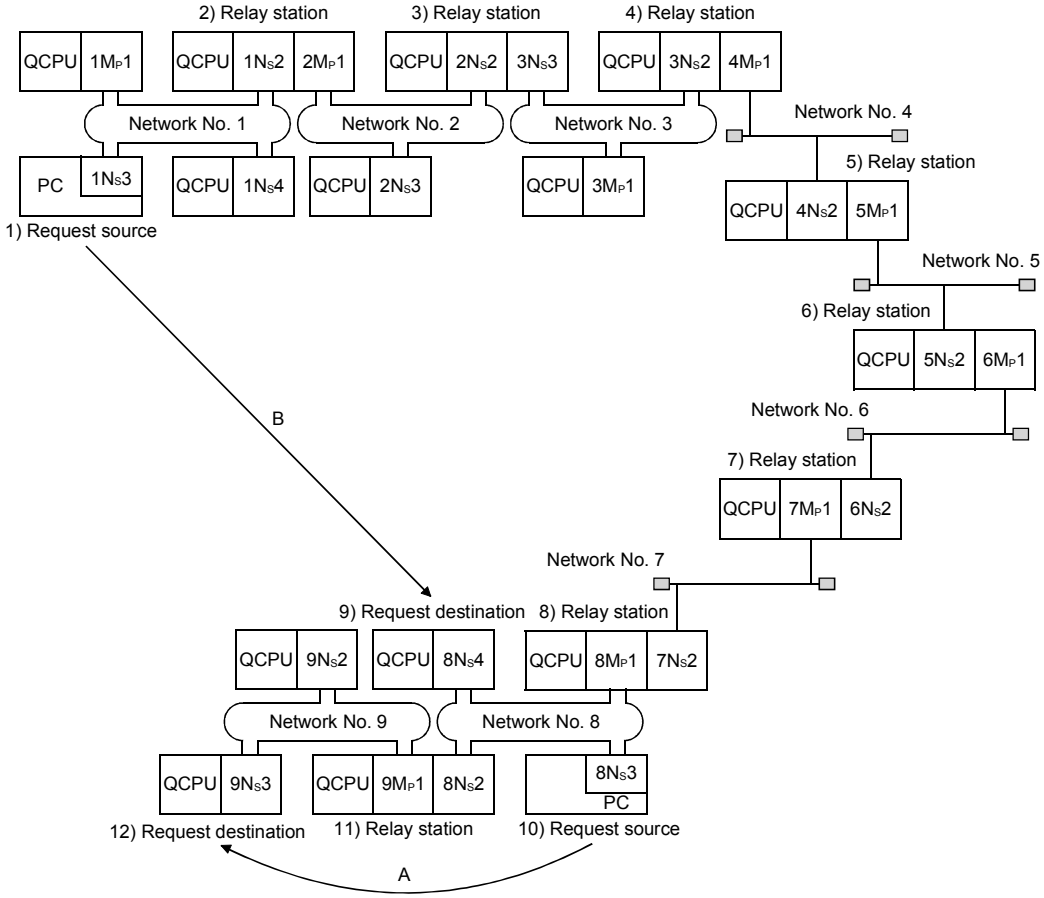


REMARK

When three or more networks are relayed through by means of routing, add the processing time from one relay station to the other relay station to the routing transmission delay time.

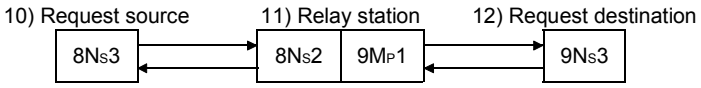
(5) Setting example

The routing parameter setting examples (A and B) are explained using the system configuration explained in Section 12.3.2.



(a) Setting example A

The routing parameter must be set for request source 10).



	No.	Transfer to network No.	Intermediate network No.	Intermediate station No.
10) Request source	1	[9]	[8]	[2]

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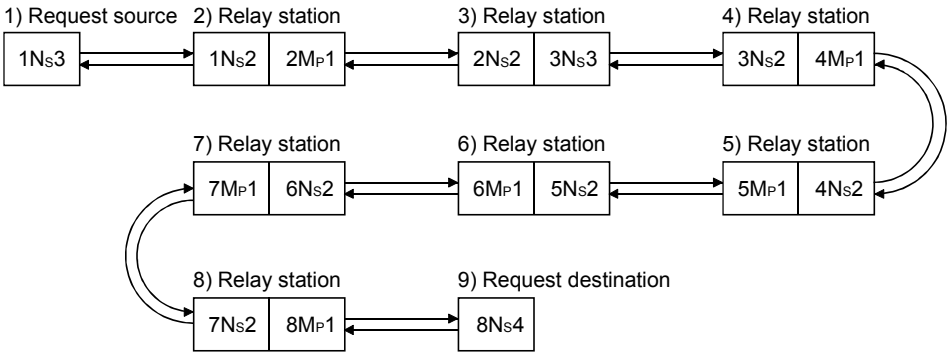
(b) Setting example B

The routing parameters must be set for the request source1), relay station 2), relay station 3), relay station 4), relay station 5), relay station 6), relay station 7), and relay station 8).

In addition, there are two types of routing parameter settings; one is used when sending data from the request source to the request destination (when sending a request), and the other is used when returning from the request destination to the request source (when sending a response).

Either one of them or both must be set for each station.



1) Request source

No.	Transfer to network No.	Intermediate network No.	Intermediate station No.	
1	[8]	[1]	[2]	Used when sending a request

2) Relay station

1	[8]	[2]	[2]	Used when sending a request

3) Relay station

1	[8]	[3]	[2]	Used when sending a request
2	[1]	[2]	[1]	Used when sending a response

4) Relay station

1	[8]	[4]	[2]	Used when sending a request
2	[1]	[3]	[3]	Used when sending a response

5) Relay station

1	[8]	[5]	[2]	Used when sending a request
2	[1]	[4]	[1]	Used when sending a response

6) Relay station

1	[8]	[6]	[2]	Used when sending a request
2	[1]	[5]	[1]	Used when sending a response

7) Relay station

1	[8]	[7]	[2]	Used when sending a request
2	[1]	[6]	[1]	Used when sending a response

8) Relay station

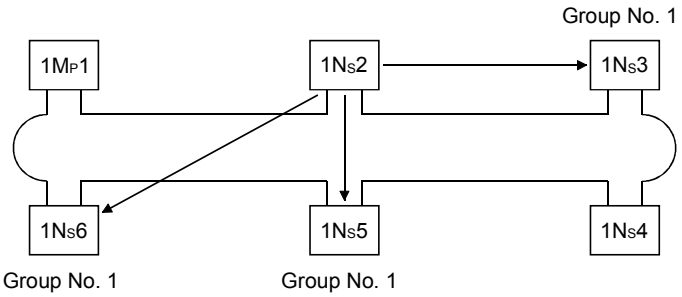
1	[1]	[7]	[1]	Used when sending a response

12.3.3 Group function

The group function is used to group the target stations of a transient transmission and send data to all of the stations in a group with a single instruction. One network may have a maximum of 32 groups.
By setting a group designation to the target station number in the control data of a dedicated instruction, stations with the matching group number retrieve the transient data.
Note that whether or not the transient transmission is normally completed cannot be verified because the data are transmitted to multiple stations.

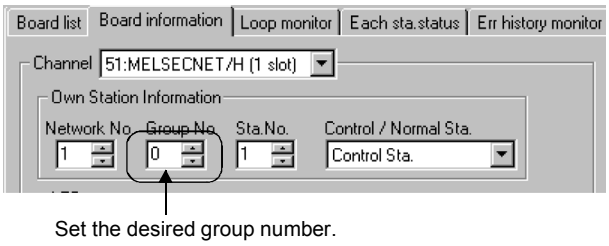
(1) Visual representation of the function

The following figure shows an example of grouping. When a transient transmission is executed by designating group No. 1, all of the three stations, 1NS3, 1NS5 and 1NS6, retrieve the transient data.



(2) Setting method

Set the group number of the MELSECNET/H board using the "Board information" screen of the MNETH utility.
Setting range : 1 to 32 (Default : 0 (no group designation))



(3) Transient transmission instructions that allows group designation

Use mdSend to execute the transient transmission instruction in the user program.

⚠CAUTION

[Precautions when executing the transient transmission by a group function]
When a group is designated, the execution of the transient transmission cannot be verified.
When this mode of transient transmission is executed successively, a "no reception buffer space error" (error code: F222) may occur. Design the system thoroughly to allow for a sufficient interval between executions, and make sure to test (debug) to confirm that successive executions can be performed without generating any error.

12.3.4 SEND/RECV function

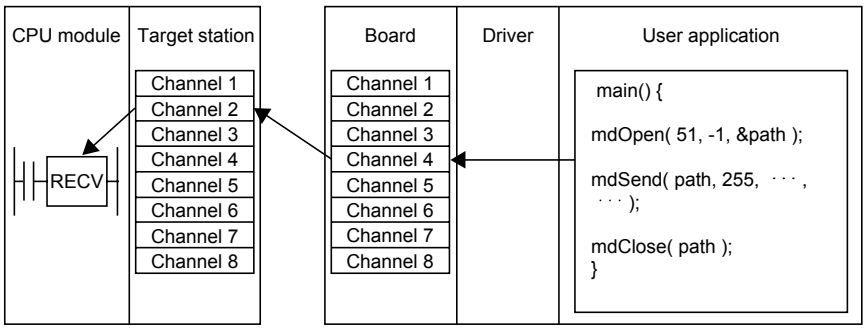
The SEND/RECV function sends/receives data to/from other station's programmable controller using the MELSEC data link library function.
This function supports the SEND/RECV instruction of link dedicated instruction.

POINT

For details of the functions, refer to "MELSEC Data Link Library Reference Manual".

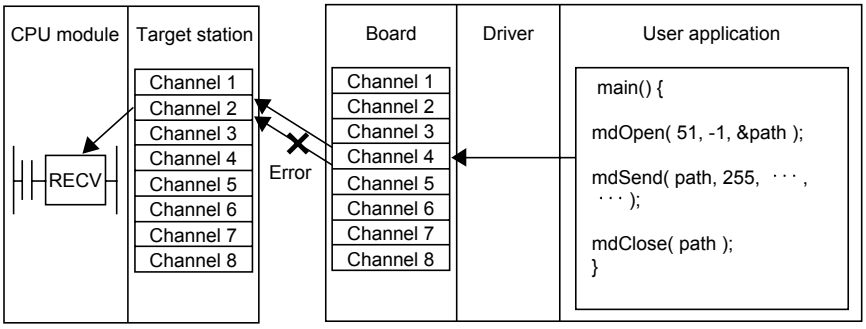
(1) SEND function

The SEND function sends data from the own station to the specified channel of the specified station using the mdSend function.
Two execution types, "arrival acknowledgment" and "no arrival acknowledgment", are available for the SEND function. When sending data with "no arrival acknowledgment" execution type, all stations in group numbers can be specified as target stations.



POINT

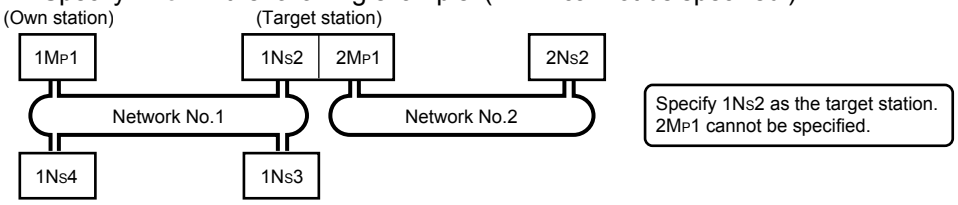
(1) An error occurs when data are sent to the same channel which is being used.



(2) Only an even number byte can be specified for a send data size.
(3) Logical station numbers cannot be specified.
(4) Even if the process of data send is completed normally with "arrival acknowledgment" execution type, data may not be received when the target station is a board. For details, refer to the RECV function.

POINT

(5) The multiple network modules are installed on the target station
Specify the network number and station number of the network module which is to be received request from the own station.
Specify 1NS2 in the following example. (2MP1 cannot be specified.)



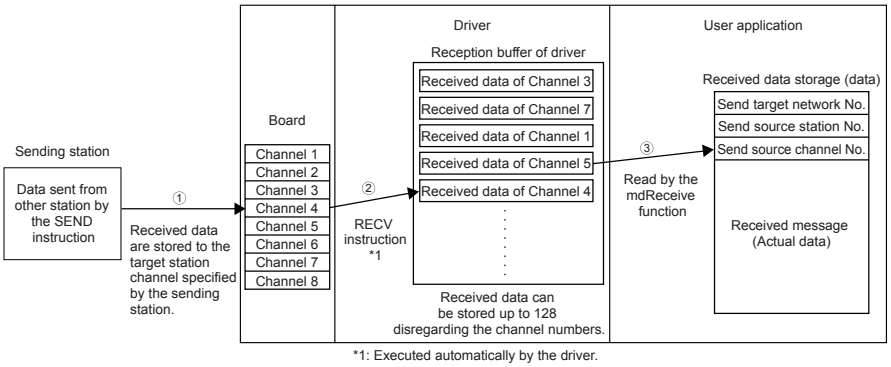
(6) When the target network is CC-Link IE Controller or CC-Link IE Field Network, specify the transmission data within the range of 2 to 960 byte. When the data larger than 960 byte is transmitted, an error will be occurred on the receive side even though the transmission completed normally on the transmit side. For the errors, refer to the following table.

Network			Error
CC-Link IE Controller	Board		No received data error (47H)
	Module		Network module error (E274H)
CC-Link IE Field	Board	Not received	Transient data improper (D25DH)
		Received	No received data error (47H)
	Module		Transient data improper (D25DH)

(2) RECV function

The RECV function reads data received by the board from the other station using the mdReceive function.

< RECV function overview >



① The board receives data sent from the other station by the SEND instruction/SEND function, and stores data to the target station channel specified at the sending side.

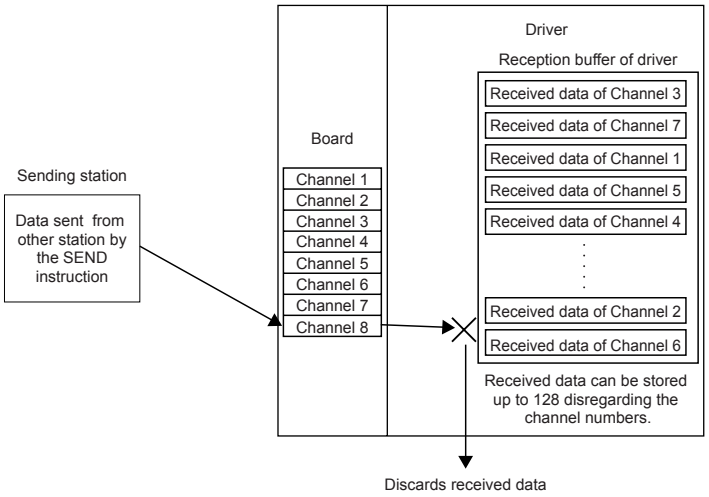
② After the board receives the data, the driver automatically executes the RECV instruction and stores the received data to the reception buffer of the driver. All data received and individually stored to channels of the board are stored to the one reception buffer of the driver which can store up to 128 of data.

③ Reads data of the specified channel number in the received order from the data stored in the reception buffer of the driver using mdReceive function.

< Operation when 128 received data are already stored in the reception buffer of the driver >

When 128 received data are already stored in the reception buffer of the driver, the subsequent data are received by the board once, but the driver automatically discards those received data at the time of storage to the reception buffer of the driver.

When the sending side sent data with "arrival acknowledgment" execution type, the process of send data is completed normally at the sending side, but data are discarded.



< Precautions for using RECV function >

① When receiving data to the multiple channels of the board, create a user program to read data from all channels that receive data.

If a channel from which data are not read exists in the channel from which data are received, the received data of the channel from which data are not read are accumulated in the reception buffer of the driver and all areas of 128 data are occupied.

In this case, the received data of other channels cannot be read because the driver automatically discards subsequent data received by the board.

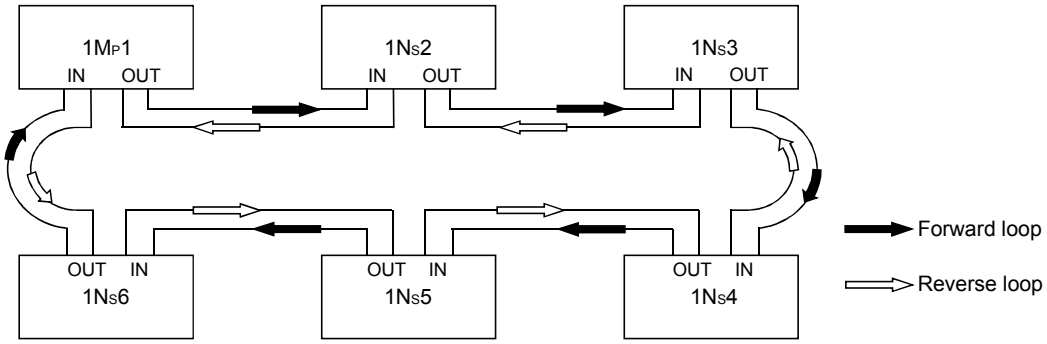
② When attempting data read by executing the mdReceive function immediately after the send data completion at the sending station, an error, "71 (0047H): No reception data error", occurs because the driver has not completed the RECV function and thus the receive data have not yet stored to the reception buffer of the driver.

Retry the operation after waiting for a while.

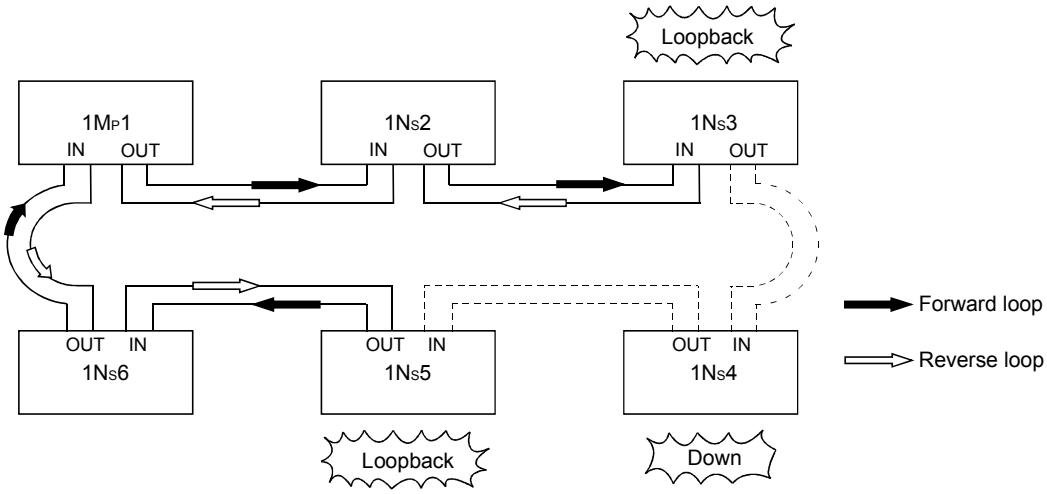
12.4 Multiplex Transmission Function (Optical Loop System)

The multiplex transmission function allows high-speed communications using duplex transmission paths (both the forward and reverse loops) in the optical loop system.
In order to execute the multiplex transmission function, setting for the "Supplementary settings" of the common parameters is required. Note that this setting is not allowed unless the total number of link stations is four stations or more.

(1) Using the multiplex transmission function, the high-speed communication is performed using both the forward and reverse loops effectively.



(2) If an error occurs in the transmission path while the multiplex transmission function is used, data linking continues by communicating only using the transmission path on one side of either the forward or reverse loop, or by switching to the communication using loopback. The transmission speed in this case is 10 Mbps or 25 Mbps.



REMARK

The multiplex transmission function is effective only in reducing the link scan time when the number of connected stations is 16 or more and the link devices assigned with common parameters is 2,048 bytes or more. The link scan time will be 1.1 to 1.3 times faster compared to when the multiplex transmission function is not used.

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13 ERROR CODE

For details of error codes displayed on the error messages of the utility, refer to the following manual.
• MELSEC Data Link Library Reference Manual

For details of error codes displayed on the Error history monitor screen (Section 9.2.8) of the utility, refer to the following manual.
• Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)
• For QnA/Q4AR MELSECNET/10 Network System Reference Manual

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MEMO

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14 TROUBLESHOOTING

This section explains the identification of the causes and troubleshooting when an error occurred.

(1) Basic checking procedure

Check if there is a corresponding error symptom written in "Cause Determination Methods by Type of Trouble".
(Refer to Section 14.1)
If the corresponding error could not be found, check the cause by following the procedure shown below.

1. Check if all the boards installed on a personal computer are displayed with the utility.
   - Check on the board list screen (Refer to Section 9.2.2)
   - Check on the Event Viewer screen (Refer to Section 14.3.2)
   - Check on the Device Manager screen (Refer to Section 14.3.3)
2. Check the LED display of the board.
   - Check the LED status (Refer to Section 6.2)
3. Check the error occurring at the utility.
   - Check with test (Refer to Section 6.5)
   - Check the network status with loop monitor (Refer to Section 9.2.6)
   - Check the each station status (Refer to Section 9.2.7)
   - Check the error history (Refer to Section 9.2.8)
4. Check the access target device.
   - Check if the board operates as set to the parameter or program by checking whether the link devices perform communication, or transient send/receive performs normally with the device monitor utility. (Refer to Section 9.3).
   - When unexpected value is input to the specific link device, refer to Section 14.5.1.
5. Check the user program.
   - Check the arguments and returned values of the communication function. (Refer to "MELSEC Data Link Library Reference Manual")

(2) When error cannot be solved

If the troubleshooting above does not help, refer to Section 14.9.

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14.1 Cause Determination Methods by Type of Trouble

When an error occurs, use the table below to find the section that describes an appropriate method to determine the cause.

No.	Error detail	Cause determination method/Corrective action
1	MELSECNET/H board did not operate normally upon startup. When executing a user program, system down (blue screen) or system reset occurred on the operating system.	Refer to Section 14.3.
2	Data link is not achieved after the MELSECNET/H board and control station as well as other normal stations were connected.	Refer to the flowchart in Section 14.4.
3	An error occurred while conducting data link. 1) An unexpected value is input to a specific link device (B, W, X, Y). 2) Data cannot be written or read even though device access has been performed using communication functions with the user program. 3) Communication is occasionally disabled while running the user program.	Refer to the flowchart in Section 14.5.
4	The external power supply function does not work properly.	Refer to Section 14.6.
5	The personal computer has slowed down. 1) Operations with the mouse or keyboard are slow. 2) Operations of other applications are slow. 3) The CPU usage is high. 4) Operations by the sound function are unstable.	Refer to Section 14.8.
6	The software is not normally installed.	Refer to Section 14.2.1.
7	Uninstallation is not executed normally.	Refer to Section 14.2.2.

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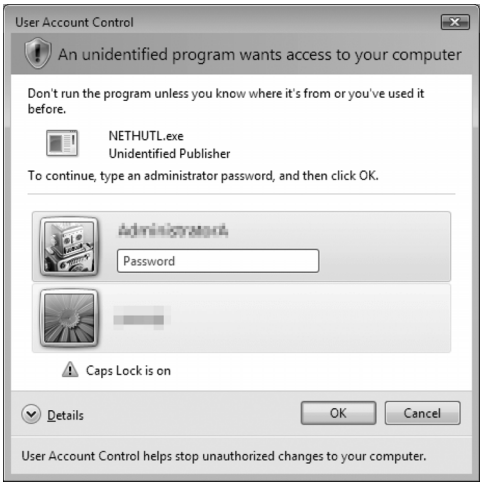
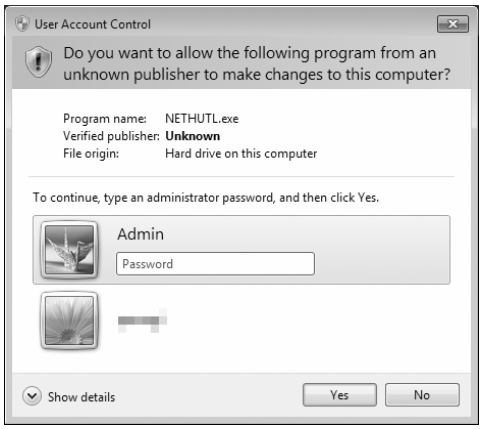
No.	Error detail	Cause determination method/Corrective action
8	The driver is not normally installed. A " ! " mark is displayed next to the icon of the driver on the Windows® Device Manager screen.	Refer to Section 14.3.3.
9	An error message is displayed in utility. 1) "It failed to read the utility file version" is displayed. 2) "It failed to read the driver package version" is displayed. 3) "It is failed to write the board setting data" is displayed. 4) "It is failed to write the target setting data" is displayed.	Logon as a user with administrator authority and execute utility (Refer to POINT in Section 9.1.) or reinstall the operating system.
10	The password is requested on the User Account Control screen when the utility is activated.   	When the utility is activated, and if the following User Account Control screen is displayed requesting a selection of user with administrator authority and password entry *1, the user who is logging on to the system does not have an administrator authority. Log off the system and login again as a user with administrator authority, and activate the utility. *2

*1: If only one user account with administrator authority is available, the User Account Control screen requests the password entry of its user only.

*2: For details on how to prevent this screen from being displayed, refer to Appendix 5.

No.	Error detail	Cause determination method/Corrective action
11	System standby error or system hibernation error is displayed. 	The power save mode (stand by, hibernate) is not supported for MELSECNET/H board. Configure the settings of the "Power Options" in the control panel to avoid the computer from activating the power save mode (stand by,hibernate).
12	CPU modules other than QCPU cannot be accessed.	CPU modules other than QCPU (Q mode) cannot be accessed to the 64-bit version of user application. Use 32-bit version of user application.
13	The utility screen is not displayed properly. The operations of utility cannot be performed.	1) Check if the display settings on the [Device Manager] or other relevant functions are correct, and install an appropriate display driver. Or update the Windows® operating system. 2) Close the other applications. 3) Change the Hardware accelerator setting of the display setting.
14	When transmitting the data using SEND function of mdSend function, the transmission is completed normally, however, the data is not received at the destination.	Refer to section 12.3.4.
15	The driver does not start up.	1) Install the board. 2) Check if the board is recognized normally on the "Device Manager" screen. (Refer to Section 14.3.3)

14.2 Troubleshooting of Installation and Uninstallation

The following explains the troubleshooting for error at installation and uninstallation.

14.2.1 Installation failed

When the installation is aborted or failed, reinstall the utility by the following procedure.

1. Check the installation and uninstallation precautions. (Refer to Section 8.1)
2. Restart the personal computer.
3. If the utility can be uninstalled, uninstall it.
   After the uninstallation, restart the personal computer.
4. Install the utility again by following the installation procedure. (Refer to Section 8.2)
   (When the instruction displayed on the screen is not effective, refer to Section 14.3.3)
5. If the personal computer does not operate normally after the reinstallaion, check if the personal computer has any problem.
   • Operating Environment (Refer to Section 2.5)
   • Checking personal computer and operating system (Refer to Section 14.3.1)

If the troubleshooting above does not help, refer to Section 14.9.

14.2.2 Uninstallation failed

When the uninstallation is failed, uninstall the utility after the reinstallation by the following procedure.

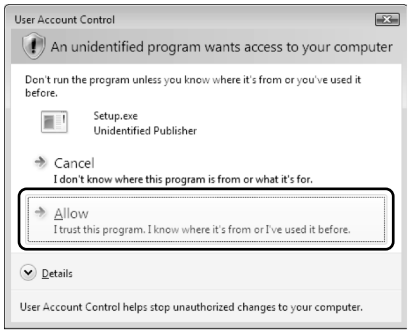
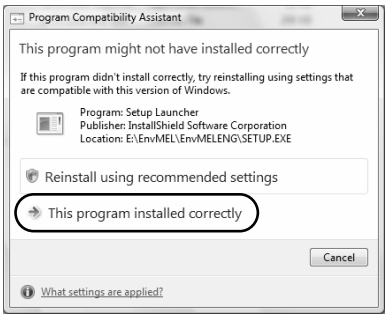
1. Check the installation and uninstallation precautions. (Refer to Section 8.1)
2. Insert the CD-ROM in the CD-ROM drive.
3. Display the "Run" screen from the Start menu or Quick Access Menu of Windows® .
4. Append "-A" and execute "Disk1\Setup.exe" of the CD-ROM.
5. Install the utility again by following the installation procedure. (Refer to Section 8.2)
6. Perform the uninstallation.
7. If the utility cannot be uninstalled normally, check if the personal computer has any problem.
   • Operating Environment (Refer to Section 2.5)
   • Checking personal computer and operating system (Refer to Section 14.3.1)

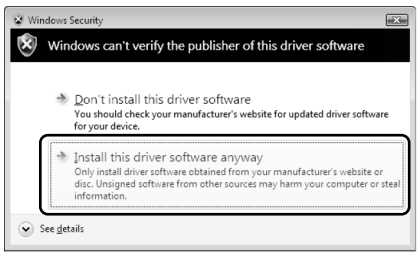
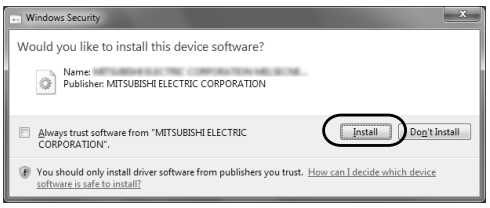
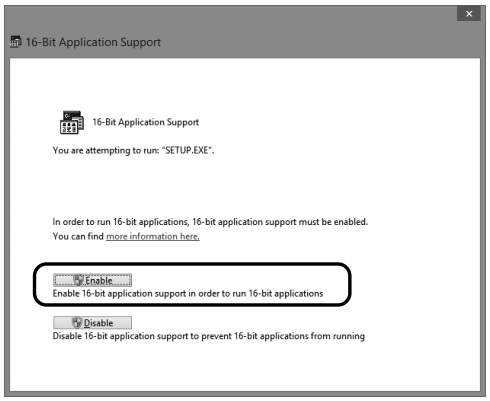
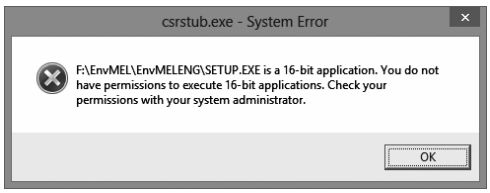
If the troubleshooting above does not help, refer to Section 14.9.

14.2.3 When the instruction displayed on the screen is not effective at installation

The following tables show the instruction when the screen is displayed.

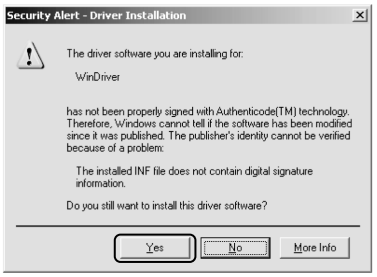
(1) Using Windows® Vista® /Windows Server® 2008/Windows Server® 2008 R2/ Windows® 7/Windows Server® 2012//Windows® 8

Screens	Instructions
 	This screen is displayed when user account control is enabled. Click "Allow" or the [Yes] button.
	Click the [Yes] button. MELSECPowerManager is installed and the Windows® Power Options settings are changed automatically. For details of MELSECPowerManager, refer to Appendix 11.
	If this screen is displayed during the installation or at the installation completion, click "This program installed correctly". If this screen is displayed when the installation is aborted, click the [Cancel] button and close the screen. Do not select "Reinstall using recommended settings". An incorrect module may be installed.

Screens	Instructions
	Click "Install this driver software anyway"
	Confirm the publisher is "MITSUBISHI ELECTRIC CORPORATION", and click the Install button. This screen may be displayed a couple of times.
	When installing "Environment of MELSOFT", this screen may be displayed. Click the Enable button.
	"Environment of MELSOFT" is a 16-bit application. Execute “\EnvMEL\EnvMELENG\SETUP.EXE" in the CD-ROM after searching “16-bit Application Support” on the control panel and setting to “Enable”.

(2) Using Windows® XP® /Windows Server® 2003 R2

Screens	Instructions
	Click the Yes button.
	This screen is displayed at the first installation. Click the Continue Anyway button. The operation test has been conducted by Mitsubishi. (Problems do not occur after the installation.) The following screen may appear behind another screen. Then, press the Alt + Tab keys to bring it to the front.

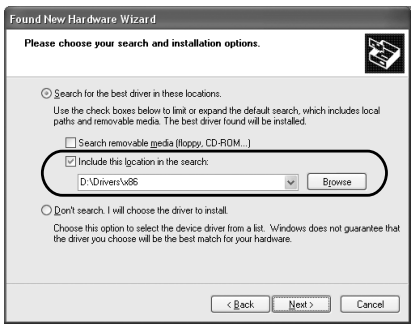
Screens	Instructions
 	For Windows® Server® 2003 R2, one of the screens shown on the left is displayed at the first installation. Click the [Yes] button.
	For Windows® Server® 2003 R2 , the screen shown on the left is displayed. Click the [Yes] button and continue installing.
	For operating system of Windows® XP Service Pack2 or later, the confirmation screen for connection to Windows® Update may be displayed. Select "No, not this time" and click the [Next] button.
	The "Found New Hardware Wizard" screen is displayed after the board installation. Refer to Section 14.2.4 and install the driver. When the utility has been started up, restart the utility after installing the driver.

14.2.4 When the driver is not installed

The driver is installed automatically when installing the board on the personal computer after installing the software package.
For Windows XP® and Windows Server 2003® R2, the following operation is required.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
Network Controller
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

↓


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
D:\Drivers\x86
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

1) The "Found New Hardware Wizard" screen is displayed after installing the board and starting up the personal computer. Select "Install from a list or specific location (Advanced)" and click the Next> button.

2) Select "Search for the best driver in these locations".
<For 32-bit version operating system*1>
Check "Include this location in the search" and specify "\Drivers\x86" of the CD-ROM drive to be used.
(Example: "D:\Drivers\x86")

<For 64-bit version operating system*1>
Check "Include this location in the search" and specify "\Drivers\x64" of the CD-ROM drive to be used.
(Example: "D:\Drivers\x64")

*1: The operating system can be checked by Windows system information.
For details, refer to the Microsoft® Knowledge Base.
http://support.microsoft.com/kb/827218/ (As of August 2013)

↓
(End)

When the "Found New Hardware Wizard" screen is not displayed automatically after the board installation, update the driver on the "Device Manager" screen.

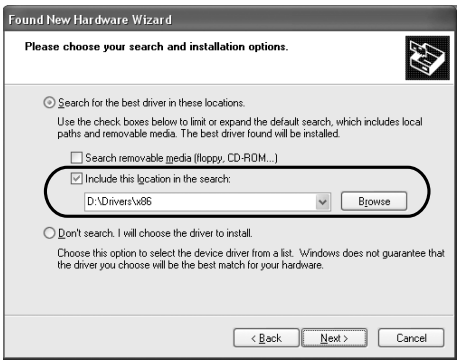
↓

1) Open the Windows® Device Manager screen. Right-click on "Network Controller" and select "Update Driver Software".

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
Network Controller
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

↓

2) Click "Install from a list or specific location (Advanced)".


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
D:\Drivers\x86
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

3) Insert the CD-ROM of the software package to the CD-ROM drive.

4) Specify the driver software for "Search for driver software in this location" according to the following information, and click the Next button.

<For 32-bit version operating system*1>
Specify "\Drivers\x86" of the CD-ROM drive to be used.
(Example: "D:\Drivers\x86")

<For 64-bit version operating system*1>
Check "Include this location in the search" and specify "\Drivers\x64" of the CD-ROM drive to be used.
(Example: "D:\Drivers\x64")

*1: The operating system can be checked by Windows system information.
For details, refer to the Microsoft® Knowledge Base.
http://support.microsoft.com/kb/827218/ (As of August 2013)

↓

(End)

If the troubleshooting above does not help, refer to Section 14.9.

POINT

If "Block - Never install unsigned driver software" is selected under [Control Panel] - [System] - [Hardware] - [Driver Signing], the driver may not be installed.
Select "Ignore - Install the software anyway and don't ask for my approval", or "Warn - Prompt me each time to choose an action", and install the driver.

14.3 When MELSECNET/H Board did not Operate Normally

When the personal computer on which the board is installed is not started, or the system shut down or system reset is occurred, check the items following the procedure shown below.

1. Uninstall the board and check if the personal computer is started.
   • Checking personal computer and operating system (Refer to Section 14.3.1)
2. After restarting the personal computer, check if there is any error.
   • Checking on Event Viewer screen (Refer to Section 14.3.2)
3. Install the board and restart the personal computer.
   • Checking the board installation status (Refer to Section 6.3.3)
   • Checking on the Device Manager screen (Refer to Section 14.3.3)

If the troubleshooting above does not help, refer to Section 14.9.

After starting the personal computer on which the board is installed, check the items following the procedure written in "Basic checking procedure". (Refer to Chapter 14(1))

(1) The system shutdown occurred when driver is uninstalled or disabled

Do not uninstall or disable the driver on the "Device Manager" screen when the board is normally recognized. If it is uninstalled or disabled, the operating system may shut down (blue screen).

14.3.1 Checking personal computer and operating system

Check if the personal computer or operating system has any problem.

Item	Corrective action
Is the power supply ensured?	Check the power outlet and power cable of the personal computer.
Does the board operate normally if uninstall the other optional boards?	• Change the installation location of the board. • Check the resource acquisition status of other board and change the resource on the BIOS setting screen or "Device Manager" screen. • Reinstall the driver of the other optional boards. • Replace the other optional boards.
Does the board operate normally on another personal computer?	• Reinstall the operating system after formatting HD. • Repair or replace the personal computer.

For the problem of the personal computer or operating system, contact the personal computer or operating system manufacturer.

14.3.2 Checking on Event Viewer screen

Event logs related to the MELSECNET/H board are displayed as "AMneth" in the Source field on the "Event Viewer" screen.
The following table lists the errors displayed in the event viewer viewer.

Event ID (0 to FFFF$_H$)	Error content	Corrective action
0 (0$_H$)	Failed to start the MELSEC network service. Failed to register the main thread of service, or failed to set the service status.	Restart the PC. If the error persists, reinstall Windows® .
257 (101$_H$)	The MELSECNET/H board is not loaded, or the I/O address is overlapping with other hardware.	Change the I/O address setting for the MELSECNET/H board or other hardware. ＊1
258 (102$_H$)	No response from hardware.	Replace the MELSECNET/H board.
259 (103$_H$)	The number of MELSECNET/H boards detected exceeds the maximum number that can be loaded.	Remove MELSECNET/H boards until the number falls within the maximum limit
260 (104$_H$)	The board conflicts with other device.	Check for overlapping setting with other optional board.
261 (105$_H$)	An attempt to create a device object has failed.	Increase the system memory.
262 (106$_H$)	An attempt to link the device name has failed.	Reinstall Windows® .
263 (107$_H$)	An attempt to secure dual-port memory has failed.	Check for overlapping setting with other optional board.
264 (108$_H$)	An attempt to perform interrupt registration has failed.	
265 (109$_H$)	An error occurred when reading I/O.	Replace the MELSECNET/H board.
266 (10A$_H$)	An error occurred when writing I/O.	
267 (10B$_H$)	An error occurred during memory transfer.	Reinstall Windows® .
268 (10C$_H$)	An error occurred during receiving process.	——
269 (10D$_H$)	An error occurred during sending process.	——
270 (10E$_H$)	An error occurred during interrupt process.	Reinstall Windows® .
271 (10F$_H$)	An error occurred during UNLOAD process.	
272 (110$_H$)	An error occurred during StartIo process.	
273 (111$_H$)	An error occurred during critical session.	
274 (112$_H$)	An error occurred during IoTimer process.	
275 (113$_H$)	An error occurred during IoCompletion process.	
276 (114$_H$)	An error occurred during DPC process.	
277 (115$_H$)	An error occurred when opening registry database.	
278 (116$_H$)	An error occurred when reading from registry database.	

Event ID 0 to FFFF$_H$	Error content	Corrective action
279 (117$_H$)	An error occurred when writing to registry database.	• After installing SW0DNC-MNETH-B, restart the computer and confirm that this error does not occur. • Increase the system memory and disk capacity.
280 (118$_H$)	A request that cannot be processed was received from other station.	——
281 (119$_H$)	Retry transmission was executed during transmission process.	——
286 (11E$_H$)	Failed to allocate the Memory Area.	Increase the memory.
287 (11F$_H$)	Link Parameter is nothing or has abnormal data.	Set the parameter with MELSECNET/H utility, and reset the board.
288 (120$_H$)	The Driver WDT error occurred on the MELSECNET/H board driver side.	Remove another option board. Take corrective actions for the Driver WDT error. (Refer to Section 14.7.2.)
295 (127$_H$)	The Board WDT error had occurred.	Replace the MELSECNET/H board.
296 (128$_H$)	The CLOCK STOP error had occurred.	
297 (129$_H$)	The Target Abort error had occurred on the PCI bus.	
304 (130$_H$)	The Data Parity error had occurred on the PCI bus.	
305 (131$_H$)	Entering sleep mode or hibernation mode, or fast startup is detected. The board is not operated normally because the sleep mode, hibernation mode, and fast startup is not supported by the board.	Change the power option not to enter the sleep mode, hibernation mode, or disable the fast startup function and restart the personal computer.
33027 (8103$_H$)	The driver is not yet started, or an error occurred while opening the driver.	Correct the cause of the driver error, then restart the PC.
33029 (8105$_H$)	An error occurred while resetting the MELSECNET/H board. One of the following two conditions is suspected as the cause. 1) The common memory area used by the MELSECNET/H board may be in contention with other device. 2) No response was received from the MELSECNET/H board.	1) Check for overlapping setting with other optional board. 2) Perform memory and I/O diagnosis using the MNETH utility. If the error persists, replace the MELSECNET/H board.

∗1 : If an event error occurs in event viewer, make the following setup setting on the PC.
(Limited to the PC includes those setup setting items.)

Example)
BIOS Setup Utility

Plug & Play O/S : [YES] → [No]
Reset Configuration Data : [No] → [YES]

Then, restart the PC.

14.3.3 Checking on Device Manager screen

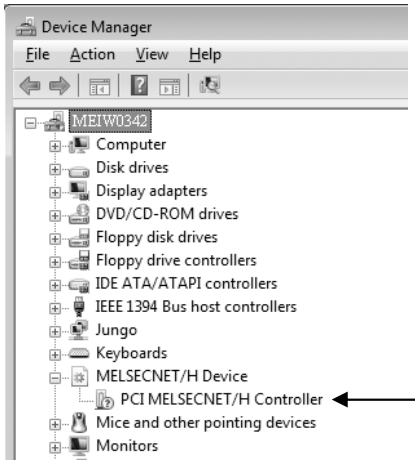
Check if the board is displayed on the Windows® Device Manager screen.

Item	Corrective action
Is the driver name of the board not displayed on the "Device Manager" screen?	The board or driver is not installed. • If the board is not installed, install the board. • If the board is already installed, check the board installation status and reinstall the board. • Reinstall the software package. • If the board operates normally on other personal computer, the personal computer may have any problems. In this case, repair or replace the personal computer. • If the board does not operate normally on other personal computer, replace the board.
Is "!" displayed next to the icon on the "Device Manager" screen?	The board installation failed. • Reinstall the software package. • Check the board installation status and reinstall the board. • If the board operates normally on other personal computer, the personal computer may have any problems. In this case, repair or replace the personal computer. • If the board does not operate normally on other personal computer, replace the board.

If the corrective action above does not help, refer to Section 14.9.

Remarks

"?" is displayed next to the icon, however, the MELSECNET/H board is recognized normally.

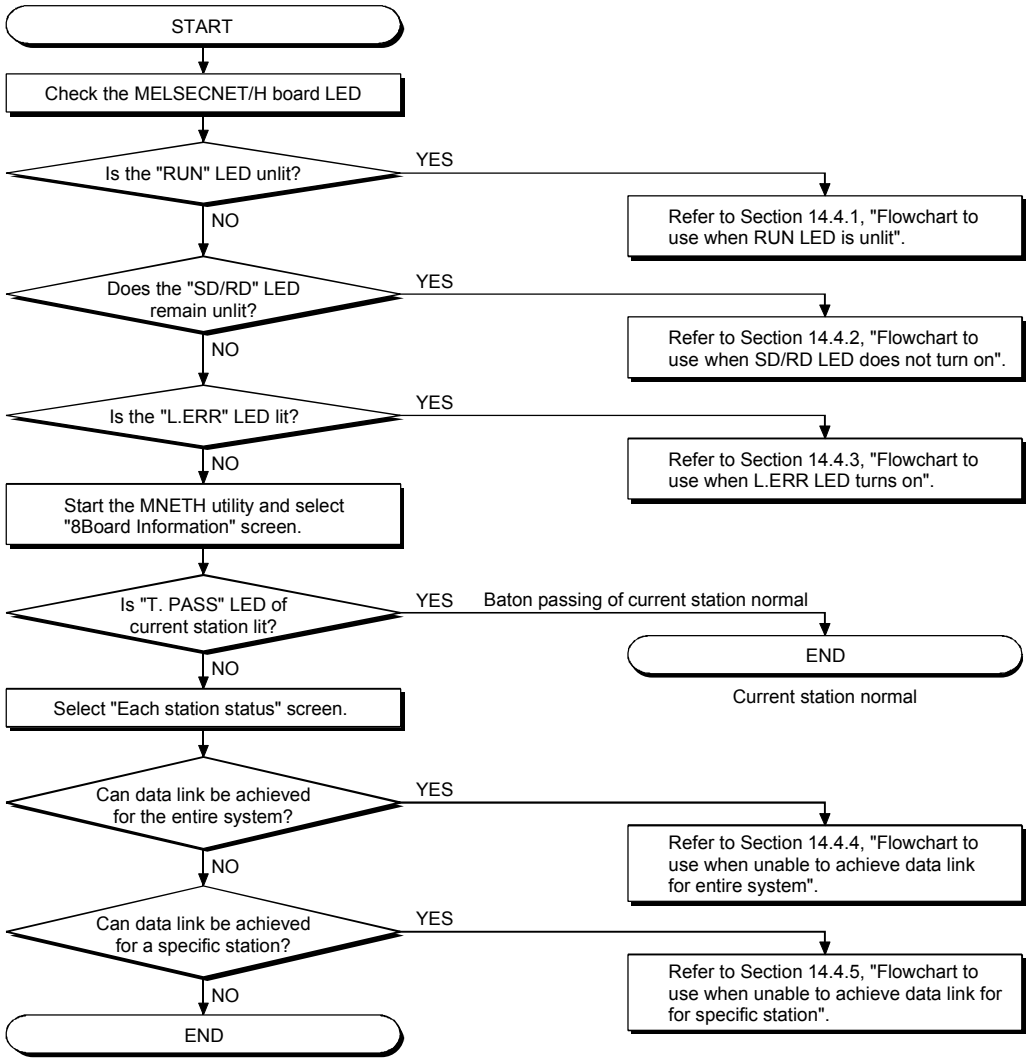


POINT

Do not uninstall or disable the driver of the board on the Device Manager when the board is normally recognized. If it is uninstalled or disabled, the operating system may shut down (blue screen).

14.4 Flowchart to Use when Data Link is not Achieved

The following describes a flowchart that must be checked when no data link is achieved after the MELSECNET/H board and Control station as well as normal stations were connected.


START
Check the MELSECNET/H board LED
Is the "RUN" LED unlit?
YES
Refer to Section 14.4.1, "Flowchart to use when RUN LED is unlit".
NO
Does the "SD/RD" LED remain unlit?
YES
Refer to Section 14.4.2, "Flowchart to use when SD/RD LED does not turn on".
NO
Is the "L.ERR" LED lit?
YES
Refer to Section 14.4.3, "Flowchart to use when L.ERR LED turns on".
NO
Start the MNETH utility and select "8Board Information" screen.
Is "T. PASS" LED of current station lit?
YES
Baton passing of current station normal
END
Current station normal
NO
Select "Each station status" screen.
Can data link be achieved for the entire system?
YES
Refer to Section 14.4.4, "Flowchart to use when unable to achieve data link for entire system".
NO
Can data link be achieved for a specific station?
YES
Refer to Section 14.4.5, "Flowchart to use when unable to achieve data link for for specific station".
NO
END

POINT

Refer to the following when the "T. PASS" LED lights up and goes out randomly.

<Cause>

The line may have been in an unstable condition.

<Action>

1) Check the connector for disconnection and the cable for breakage.
2) Verify that the specified cable is used.
3) Check that the overall extension cable length and station-to-station distance is within the specified range.

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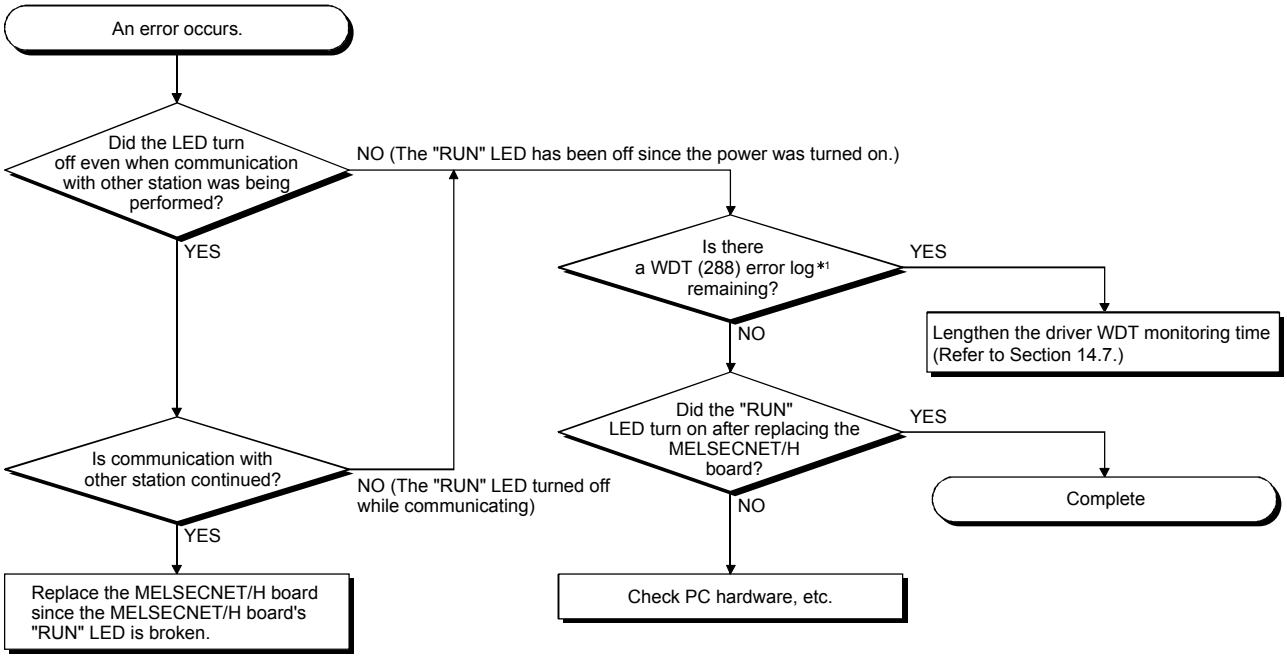
14.4.1 Flowchart to use when RUN LED is unlit


An error occurs.
Did the LED turn off even when communication with other station was being performed?
NO (The "RUN" LED has been off since the power was turned on.)
YES
Is there a WDT (288) error log*1 remaining?
YES
Lengthen the driver WDT monitoring time (Refer to Section 14.7.)
NO
Did the "RUN" LED turn on after replacing the MELSECNET/H board?
YES
Complete
NO
Check PC hardware, etc.
Is communication with other station continued?
NO (The "RUN" LED turned off while communicating)
YES
Replace the MELSECNET/H board since the MELSECNET/H board's "RUN" LED is broken.

*1: WDT error logs can be checked on the event viewer. (Refer to 14.3.2)

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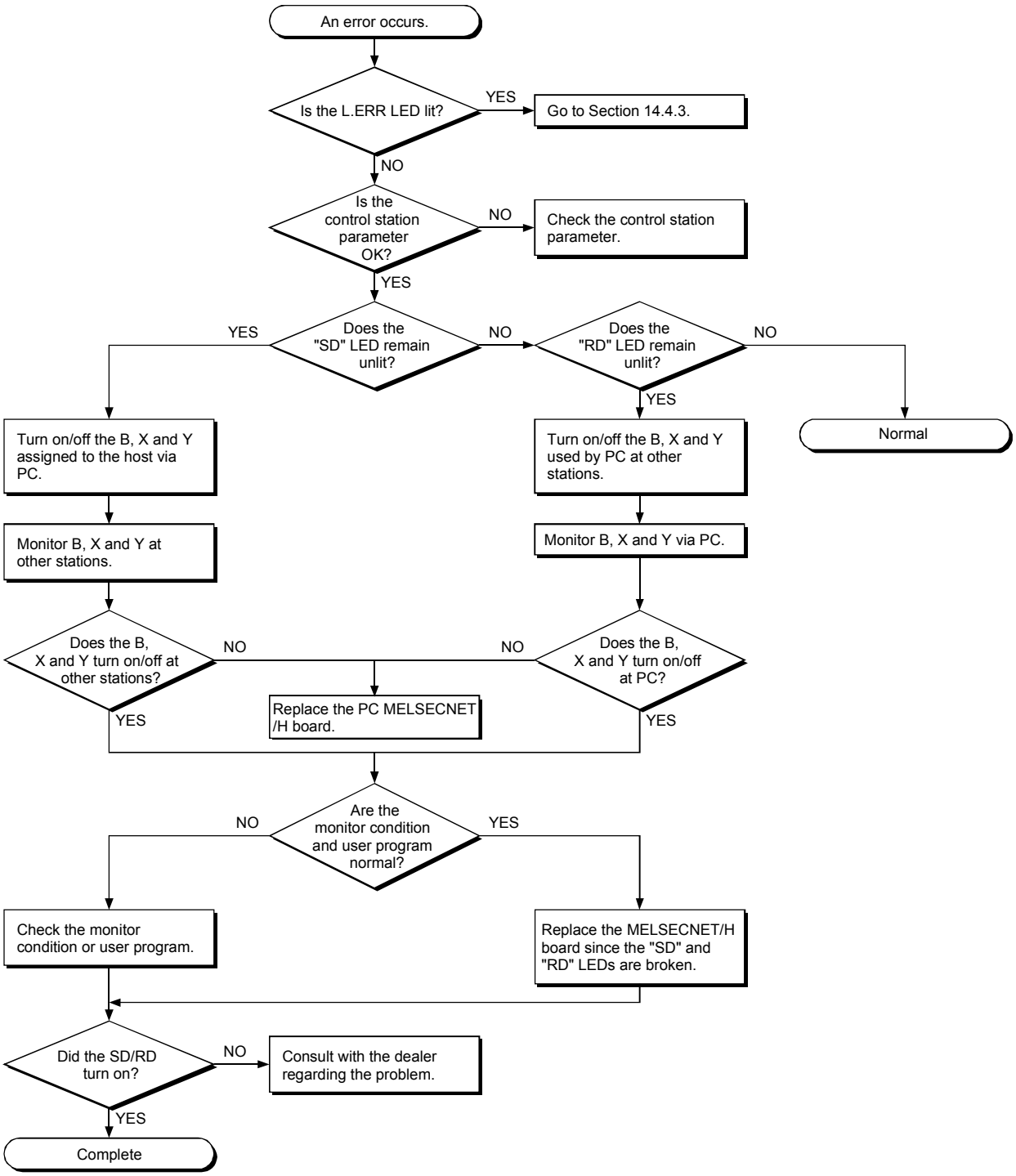
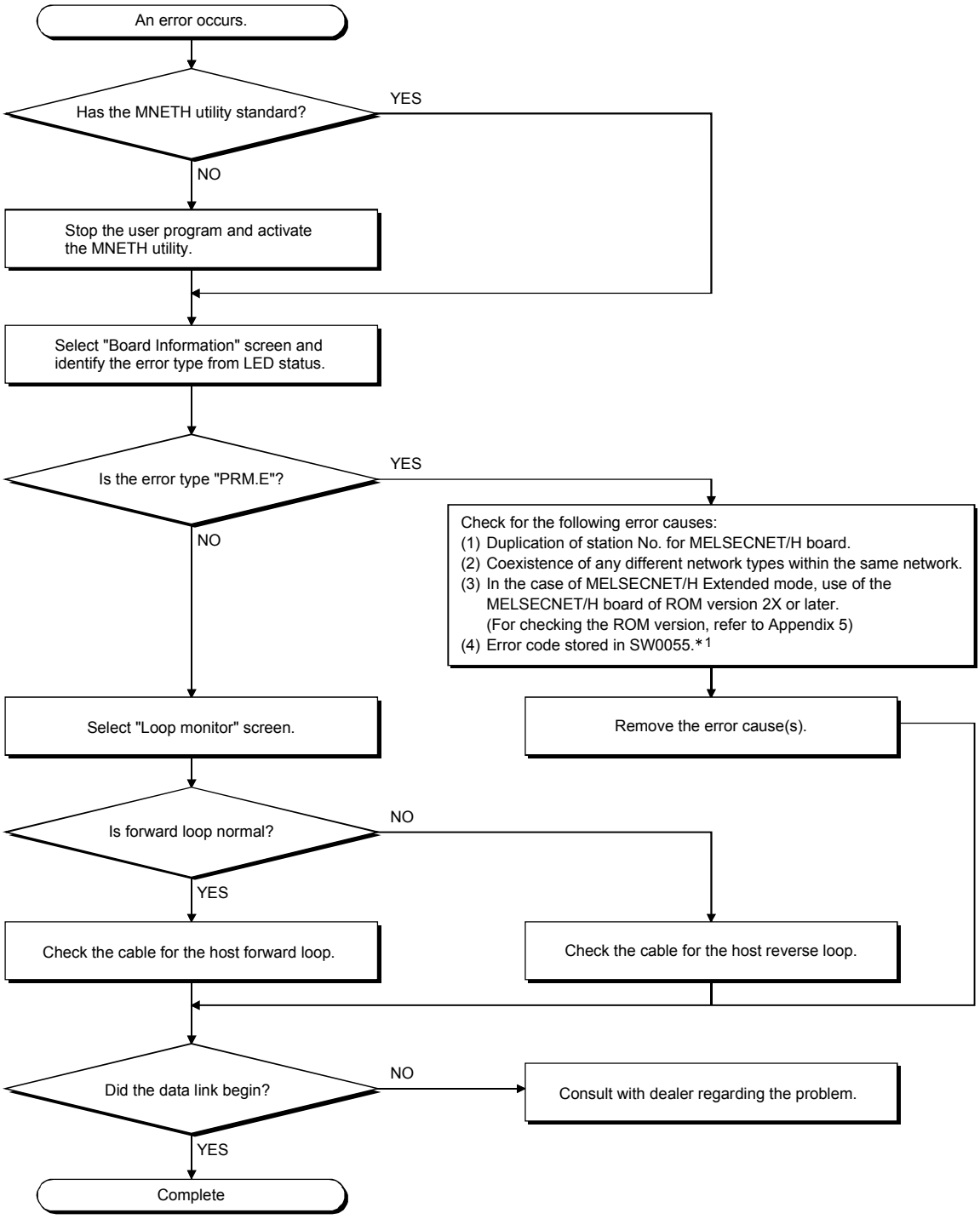
14.4.2 Flowchart to use when SD/RD LED does not turn on

The board information screen of MNETH utility displays SD and RD LED status. This function is the same as the MELSECNET/H board's LED messages.

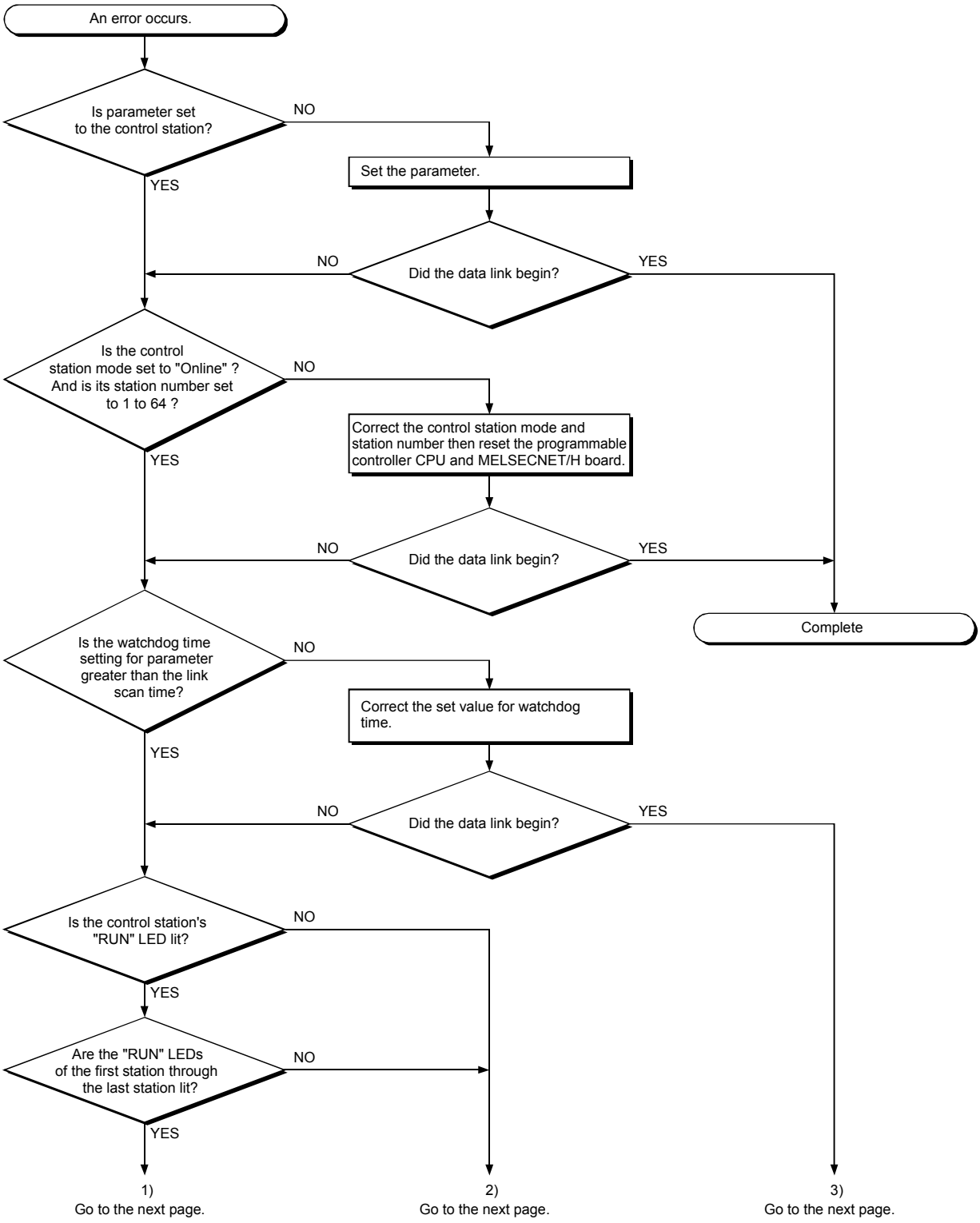

An error occurs.
Is the L.ERR LED lit?
YES
Go to Section 14.4.3.
NO
Is the control station parameter OK?
NO
Check the control station parameter.
YES
Does the "SD" LED remain unlit?
YES
NO
Does the "RD" LED remain unlit?
NO
YES
Normal
Turn on/off the B, X and Y assigned to the host via PC.
Turn on/off the B, X and Y used by PC at other stations.
Monitor B, X and Y at other stations.
Monitor B, X and Y via PC.
Does the B, X and Y turn on/off at other stations?
NO
NO
Does the B, X and Y turn on/off at PC?
YES
Replace the PC MELSECNET /H board.
YES
Are the monitor condition and user program normal?
NO
YES
Check the monitor condition or user program.
Replace the MELSECNET/H board since the "SD" and "RD" LEDs are broken.
Did the SD/RD turn on?
NO
Consult with the dealer regarding the problem.
YES
Complete

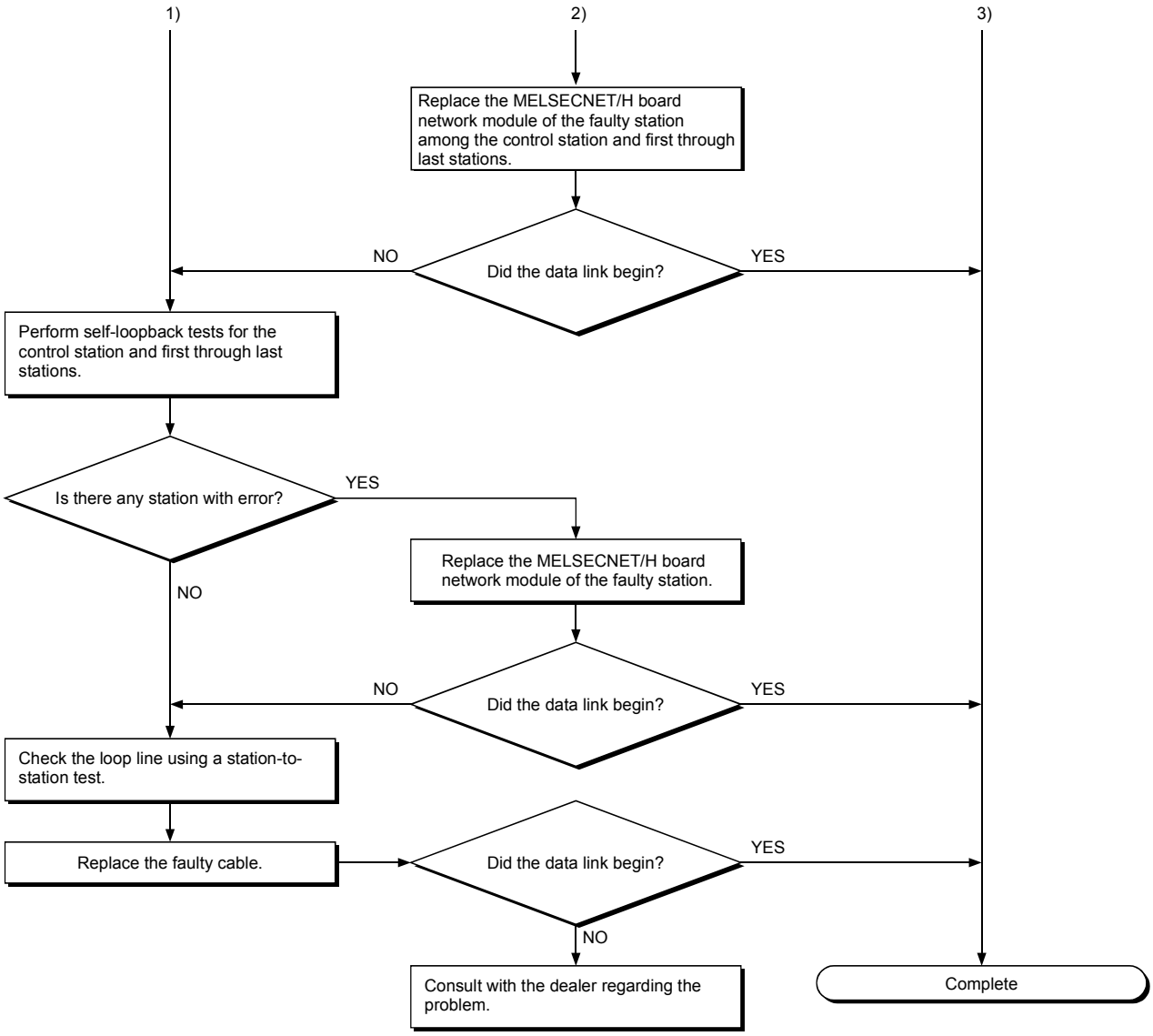
14.4.3 Flowchart to use when L.ERR. LED turns on


An error occurs.
Has the MNETH utility standard?
YES
NO
Stop the user program and activate the MNETH utility.
Select "Board Information" screen and identify the error type from LED status.
Is the error type "PRM.E"?
YES
NO
Check for the following error causes:
(1) Duplication of station No. for MELSECNET/H board.
(2) Coexistence of any different network types within the same network.
(3) In the case of MELSECNET/H Extended mode, use of the MELSECNET/H board of ROM version 2X or later.
(For checking the ROM version, refer to Appendix 5)
(4) Error code stored in SW0055.*1
Select "Loop monitor" screen.
Remove the error cause(s).
Is forward loop normal?
NO
YES
Check the cable for the host forward loop.
Check the cable for the host reverse loop.
Did the data link begin?
NO
Consult with dealer regarding the problem.
YES
Complete

*1: For the error code in SW0055, refer to the "Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)".
The error code in SW0085 can be also checked by monitoring SD85 with Device Monitor Utility. (Refer to Section 9.3.)

14.4.4 Flowchart to use when unable to achieve data link for entire system


An error occurs.
Is parameter set to the control station?
NO
Set the parameter.
YES
Did the data link begin?
NO
YES
Is the control station mode set to "Online" ? And is its station number set to 1 to 64 ?
NO
Correct the control station mode and station number then reset the programmable controller CPU and MELSECNET/H board.
YES
Did the data link begin?
NO
YES
Complete
Is the watchdog time setting for parameter greater than the link scan time?
NO
Correct the set value for watchdog time.
YES
Did the data link begin?
NO
YES
Is the control station's "RUN" LED lit?
NO
YES
Are the "RUN" LEDs of the first station through the last station lit?
NO
YES
1)
Go to the next page.
2)
Go to the next page.
3)
Go to the next page.


1)
2)
3)
Replace the MELSECNET/H board network module of the faulty station among the control station and first through last stations.
NO
Did the data link begin?
YES
Perform self-loopback tests for the control station and first through last stations.
Is there any station with error?
YES
Replace the MELSECNET/H board network module of the faulty station.
NO
NO
Did the data link begin?
YES
Check the loop line using a station-to-station test.
Replace the faulty cable.
Did the data link begin?
YES
NO
Consult with the dealer regarding the problem.
Complete

REMARK

For the Q80BD-J71LP21-25, Q81BD-J71LP21-25 or Q80BD-J71LP21S-25 with the communication speed set to 25 Mbps, mounting multiple boards with the same network No. is not allowed. Doing so may cause errors at all stations at the time of OS startup/shutdown or when resetting the board. If multiple boards with the same network No. should be installed, set the communication speed to 10Mbps.

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14.4.5 Flowchart to use when unable to achieve data link for specific station

*1: When a faulty station is detected, check if the data link cable of the faulty station is connected properly.
If the data link cable is disconnected, make sure to power off the personal computer and external power supply before reconnecting the cable.

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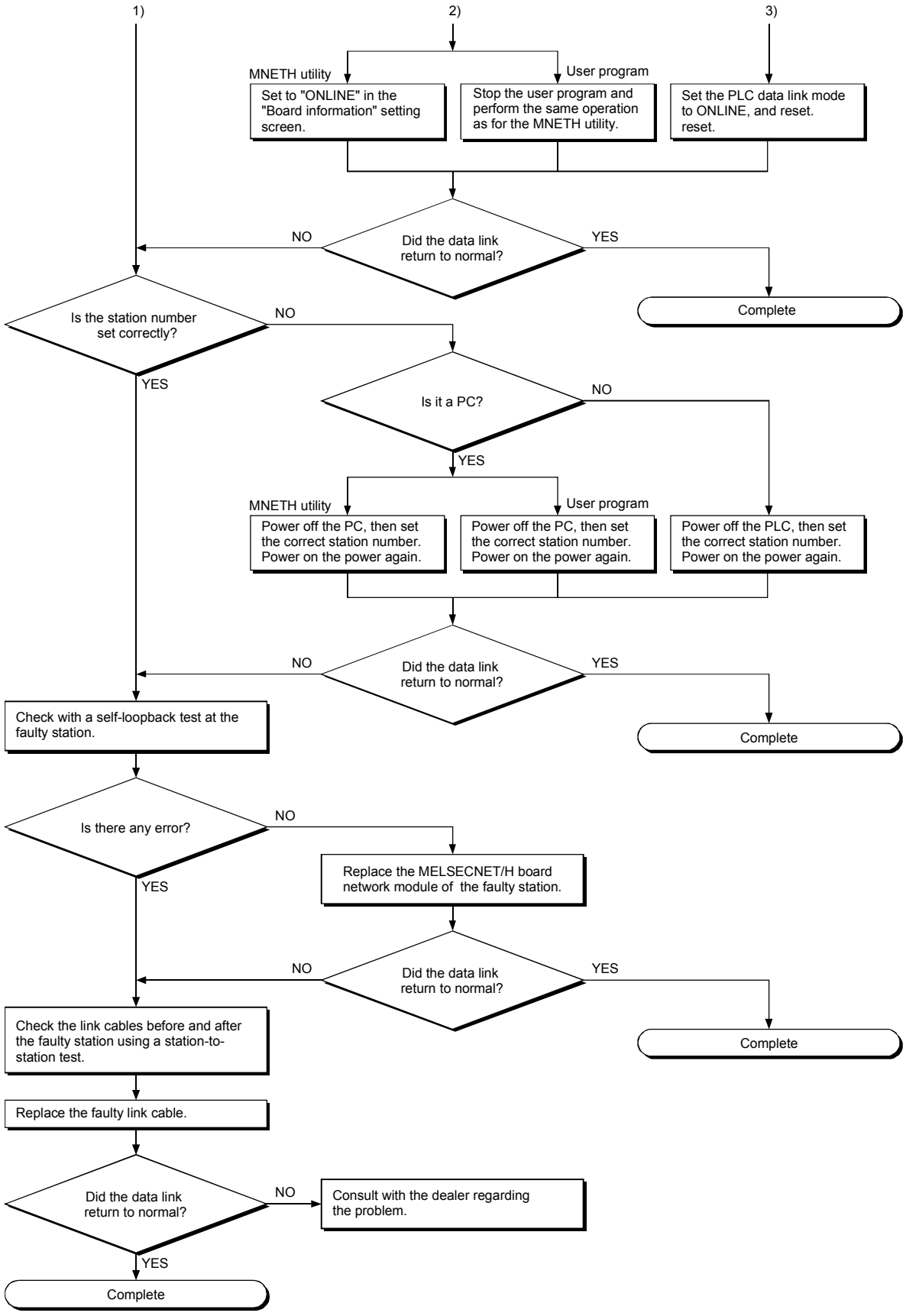
1)
2)
3)
MNETH utility
User program
Set to "ONLINE" in the "Board information" setting screen.
Stop the user program and perform the same operation as for the MNETH utility.
Set the PLC data link mode to ONLINE, and reset.
reset.
Did the data link return to normal?
NO
YES
Complete
Is the station number set correctly?
NO
YES
Is it a PC?
NO
YES
MNETH utility
User program
Power off the PC, then set the correct station number. Power on the power again.
Power off the PC, then set the correct station number. Power on the power again.
Power off the PLC, then set the correct station number. Power on the power again.
Did the data link return to normal?
NO
YES
Complete
Check with a self-loopback test at the faulty station.
Is there any error?
NO
YES
Replace the MELSECNET/H board network module of the faulty station.
Did the data link return to normal?
NO
YES
Complete
Check the link cables before and after the faulty station using a station-to-station test.
Replace the faulty link cable.
Did the data link return to normal?
NO
Consult with the dealer regarding the problem.
YES
Complete

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14.5 Flowchart to Use when Error Occurred During Data Link

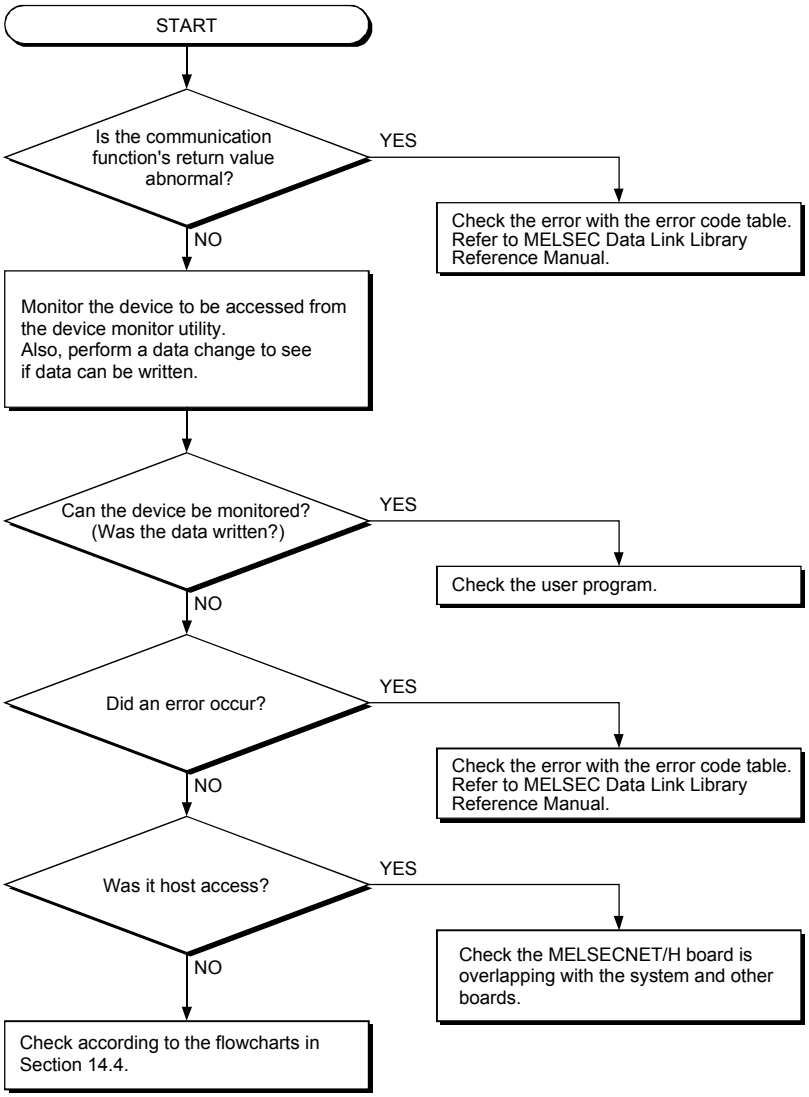
The following explains corrective actions when an error occurred during data link.

14.5.1 Flowchart to use when unexpected value is input to specific link device

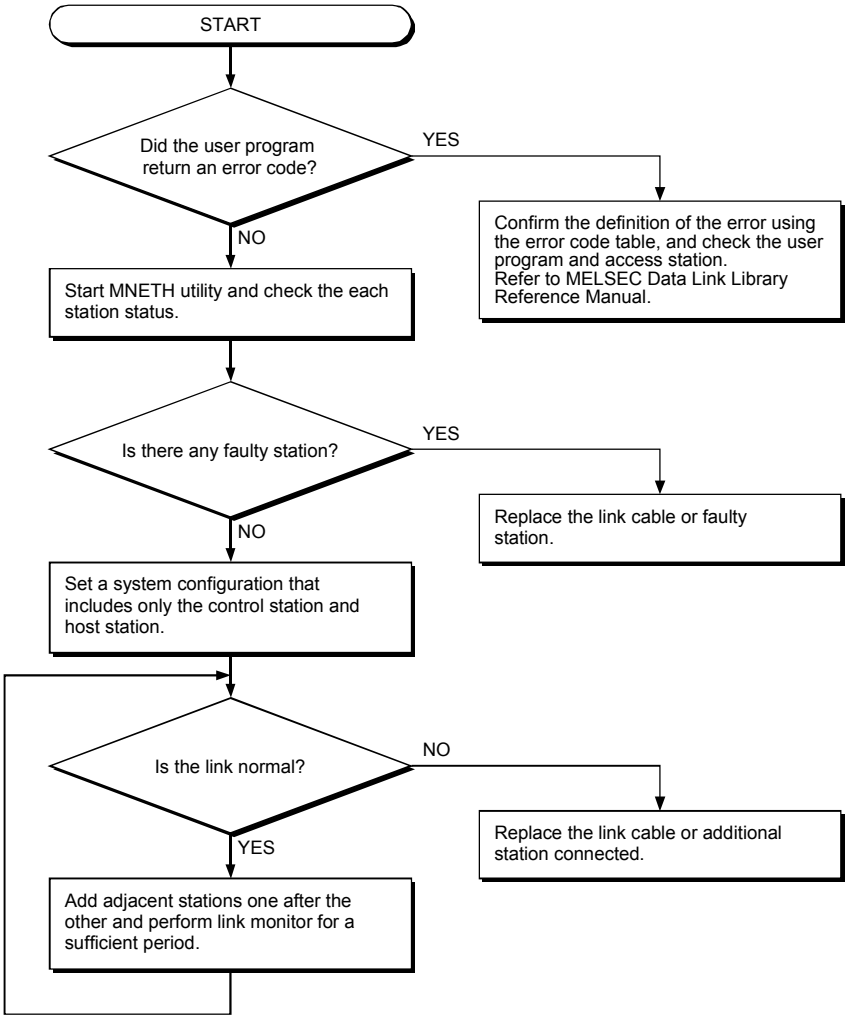
Check the following items.

(1) Check for a station with link error using the each station status screen.
(2) Check the parameter assignment range at the control station.
(3) Check the device range used in the programmable controller program at the programmable controller.
(4) Check, in the user program, argument data for the Data Link function accessing the specific link device.

14.5.2 Flowchart to use when data cannot be written or read in user program


START
Is the communication function's return value abnormal?
YES
Check the error with the error code table. Refer to MELSEC Data Link Library Reference Manual.
NO
Monitor the device to be accessed from the device monitor utility. Also, perform a data change to see if data can be written.
Can the device be monitored? (Was the data written?)
YES
Check the user program.
NO
Did an error occur?
YES
Check the error with the error code table. Refer to MELSEC Data Link Library Reference Manual.
NO
Was it host access?
YES
Check the MELSECNET/H board is overlapping with the system and other boards.
NO
Check according to the flowcharts in Section 14.4.

14.5.3 Flowchart to use when communication is disabled from time to time during user program execution


START
Did the user program return an error code?
YES
Confirm the definition of the error using the error code table, and check the user program and access station.
Refer to MELSEC Data Link Library Reference Manual.
NO
Start MNETH utility and check the each station status.
Is there any faulty station?
YES
Replace the link cable or faulty station.
NO
Set a system configuration that includes only the control station and host station.
Is the link normal?
NO
Replace the link cable or additional station connected.
YES
Add adjacent stations one after the other and perform link monitor for a sufficient period.

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14.5.4 Precautions for installing other optional board

Executing user programs (including the device monitor utility) for each board simultaneously under the following condition may cause an error.
When an error occurs in the user program, take the action shown below.

<Condition>

A personal computer into which the MELSECNET/H board and other optional board are installed and where the resources were allocated automatically by Plug-and-Play is used.

<Action>

(1) Change the positions where the MELSECNET/H board and other optional board are installed.
(2) In the BIOS setup, exchange the IRQs between the MELSECNET/H board and other optional board or change their IRQs.

14.6 When External Power Supply Function does not Work Properly

When the external power supply does not operate properly, check the following items.

Item	Corrective action
Is the LED of external power supply OFF?	Review the wiring of the external power supply cables. Inset the connectors and contacts until they click. (Refer to 6.4.4)
Is the voltage output to the connector of the external power supply cable?	Set the voltage between the pins of the connector (cable side) is within the range of the specification (Section 3.2). Check the external power supply.

If any of the corrective actions above do not help, refer to Section 14.9.

14.7 Troubleshooting for WDT Error Occurrence

14.7.1 Board WDT error

When the board WDT error occurred, check the following items.

Item	Corrective action
Is the board installed properly?	• Check the board installation status.
Does the board operate on other personal computer?	• After formatting the HD, install the operating system again. • Repair or replace the personal computer.

If any of the corrective actions above do not help, refer to Section 14.9.

14.7.2 Driver WDT error

When the driver WDT error occurred, check the following items.

Item	Corrective action
Has the error occurred due to the system overload temporarily?*1	• Reset the board. (Refer to Section 9.2.9) • Restart the personal computer
Is the same error occurred repeatedly? (Is the system overloaded constantly?)	• Remove the factor of system overload. • Disable the driver WDT function or increase the driver WDT monitoring time. (Refer to Section 9.2.11)

*1: A driver WDT error may occur when the system is overloaded temporarily due to the following factors.

- Windows® start processing at the personal computer startup
- Operation of a device driver such as a graphic board
- Operation of other software applications

If any of the corrective actions above do not help, refer to Section 14.9.

14.8 Troubleshooting for Slow PC Operation

This section explains probable causes and troubleshooting when a PC becomes slow.

(1) Possible causes for slow PC operation

The MELSECNET/H driver refreshes link device data assigned to another station from the refresh data storage area on the MELSECNET/H board to the MELSECNET/H drive buffer, and those assigned to the host station from the drive buffer to the refresh data storage area at specified intervals. *1
If more than one of the following causes occurs, the processing time for the above link refresh is increased in the total PC processing and causes slow operation:

- Too many link device points are set for the entire network.
- The link scan time value is too small.
- The computational power of the PC is low.

*1: It indicates the case where Link Refresh is selected in the Link Device Access Method setting on the MNETH utility's "Driver" screen.

(2) Troubleshooting

When the PC becomes slow, perform the following:

- Increase the link refresh interval value on the MNETH utility's "Driver" screen.
- Set the constant link scan in Common parameter setting of the control station.
- Decrease the number of link device points in Common parameter setting of the control station.

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14.9 Information Needed when Calling with Inquiry

When the troubleshooting cannot solve the problem, or a board failure occurs, please consult your local Mitsubishi service center or representative.
Inform the following conditions and situations when inquiring the problems.

(1) Product information

(a) Product version

Inform the model name and version of the board and utility.

(b) Personal computer

Inform the following descriptions.

- Name of the personal computer (manufacturer)
- CPU
- Memory size
- Operating system

(c) Other option board

Inform the following descriptions.

- Existence (If exist, type, the number of boards and so on)
- Situation checked with disconnecting other option boards

(2) Failure content

(a) Failure description (details)

Example) The LINK LED does not turn on even though the computer is turned on.

(b) Occurrence frequency

(c) Occurrence condition

If the failure occurs only in the specific case, inform the occurrence condition noticed.

(c) Troubleshooting result

Inform the following descriptions.

- The result of troubleshooting performed
- The situation when checking with other boards or computers

Example) Event ID 295 "The Board WDT error had occurred." error is displayed on the event viewer when the personal computer is started. It also occurs when mounting the problem board with another computer. Other boards mounted with the computer works properly.

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MEMO

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APPENDIX

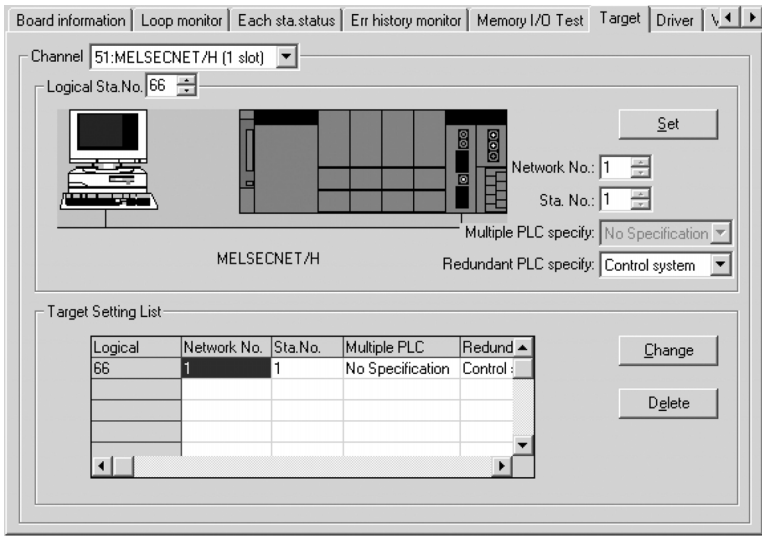
Appendix 1 Cautions for Accessing Redundant CPU System

This section explains the cautions for accessing a Redundant CPU system using the MELSECNET/H board.

Access to Redundant CPU system

(1) Redundant CPU specify

When the system (control system, standby system, System A, System B) of the Redundant CPU is specified to access the Redundant CPU, the Logical Sta. No. set on the "target" screen of the MELSECNET/H utility is used for access.
Refer to Section 9.2.10 for the setting of the Logical Sta. No.



App.

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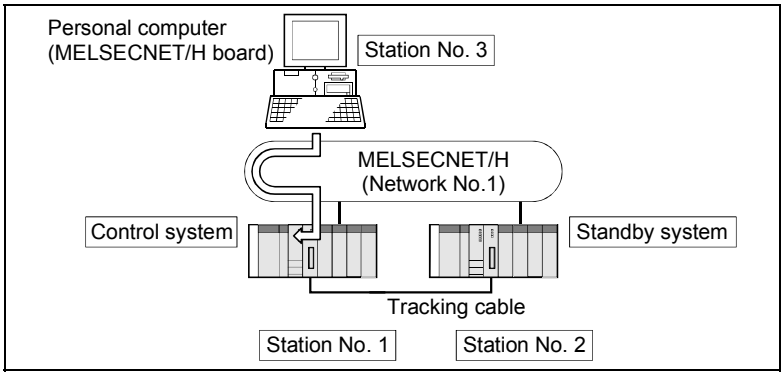
(2) Operation at occurrence of system switching

When system switching occurs during access to the Redundant CPU, access to the Redundant CPU set for the Logical Sta. No. is continued.

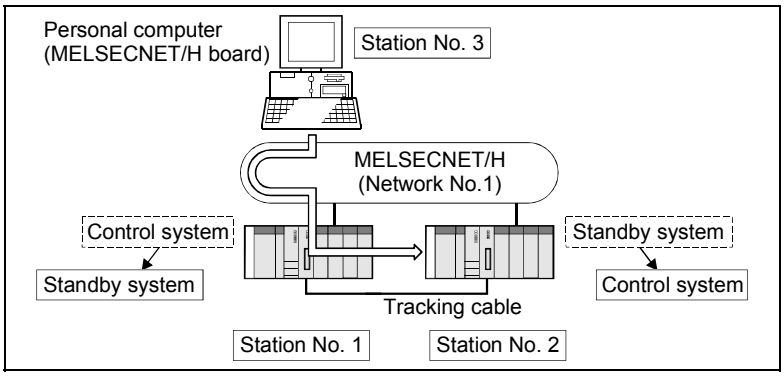
(Example) When the following Logical Sta. No.66 was specified for access Logical Sta. No.66

Network No.: 1
Sta. No.: 1
Multiple PLC specify: No specification
Redundant PLC specify: Control system

Before system switching



After system switching



App.

POINT

To judge which system in the Redundant CPU system is being accessed by MELSECNET/H board, create a program to monitor the following special relays.

(1) When checking which system is being accessed, System A or System B

SM1511	System A identification flag	• Identifies system A/system B of a redundant system. • Remains ON/OFF even if the tracking cable is disconnected while the redundant system is running.
SM1512	System B identification flag	

	System A	System B	At the time of TRK.CABLE ERR.(Error code: 6120) occurrence (System not determined.)
SM1511	ON	OFF	OFF
SM1512	OFF	ON	OFF

(2) When checking the operation system status

SM1515	Control/ Standby system status	• Indicates the CPU module operation status • Remains ON/OFF even if the tracking cable is disconnected while the redundant system is running.
SM1516		

	Control system	Standby system	At the time of TRK.CABLE ERR.(Error code: 6120) occurrence (System not determined.)
SM1515	ON	OFF	OFF
SM1516	OFF	ON	OFF

(3) Retry processing for error that will occur during system switching processing

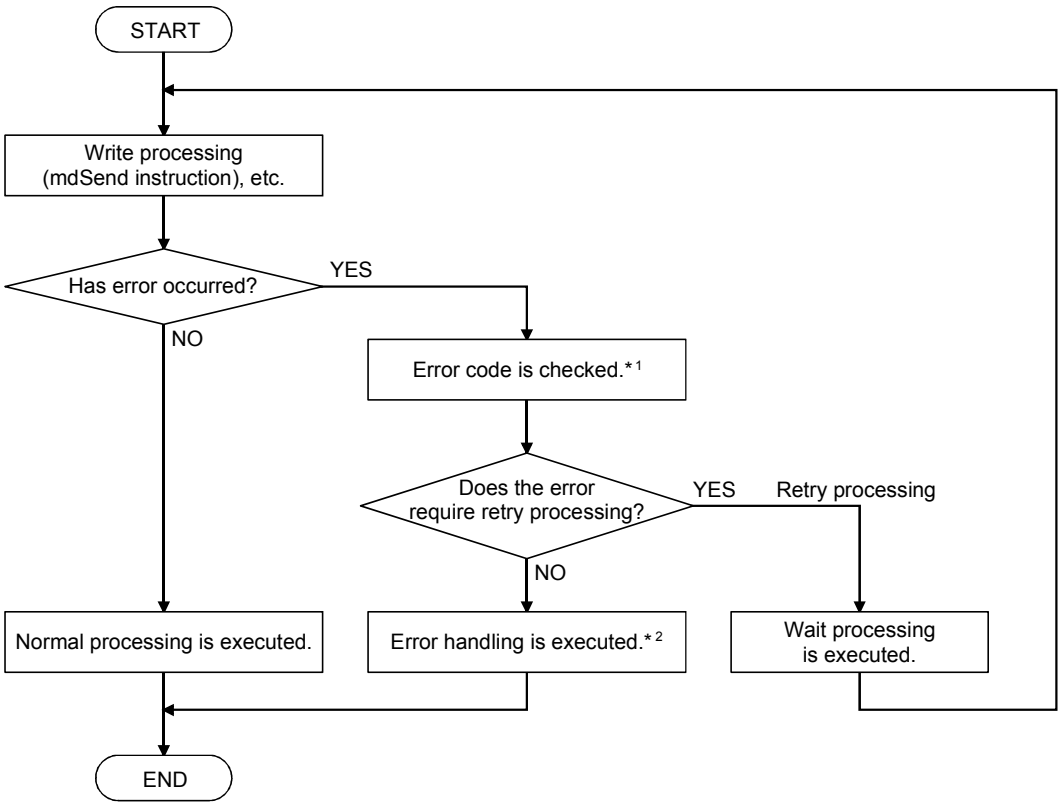
When the MELSEC data link library is used to access the Redundant CPU during system switching being processed by the Redundant CPU, a system switching error (error code 4248H), CPU starting error (error code 4004H), other system CPU module error (error code 4245H),access destination illegal error (error code FFDFH) or similar error occurs.

Create a program that will check the error code and perform retry processing as necessary in that case.

(a) The following indicates the functions that will result in error if executed during system switching.

	Functions that will result in error by system switching
MELSEC data link library	mdControl,mdDevRst,mdDevSet,mdRandR,mdRandW, mdReceive,mdSend,mdTypeRead

(b) The following example gives a flowchart for error occurrence at batch write.



*1: For the details and corrective action of the error code, refer to "Error code returned to request source during communication with CPU module" in the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

*2: Execute retry processing as required depending on the system specifications.

(4) Automatic switching of communication route

If a communication error occurs during access to the Redundant CPU connected to MELSECNET/H, the communication route is automatically switched to continue access to the control system.
Hereinafter, this automatic switching of the communication route is referred to as route switching.

The following describes the route switching conditions, how to check for route switching occurrence, and access to the control system by route switching.

(a) Route switching conditions

When access is being made under the following conditions, access to the Redundant CPU is continued by route switching if a communication error occurs.

	Conditions for continued access
Operation mode	Backup mode, Separate mode
Target system	Control system, Standby system, System A, System B

However, if a tracking error ∗1 had already occurred at a start of communication, access to the control system is not continued by route switching even if tracking is recovered after that.

∗1: Includes the status in which either Redundant CPU is powered off or reset.

(b) How to check whether route switching occurred or not and examples of access by route switching

1) How to check whether route switching occurred or not

When communication is being made in Target system, whether communication is continued by route switching due to communication error can be estimated.
Create a program that will monitor the following special relay and special registers.

<Special relay and special registers to be monitored and estimated possibility of route switching>

SM1600 ∗1	SD1590 ∗2	SD1690 ∗2	Possibility of route switching	Reference
OFF	Either one is other than 0		Since a system switching request from the network module was detected, route switching may have been executed.	2) Fig. 1
ON	0	0	Since an other system fault occurred, route switching may have been executed.	2) Fig. 2
ON	Either one is other than 0		Since an other system fault occurred or a system switching request from the network module was detected, route switching may have been executed.	2) Fig. 2 2) Fig. 1

∗1: Even if SM1600 is ON, route switching does not occur when the CPU is not accessed via the tracking cable.

∗2: When using SM1600, SD1590 and SD1690 to estimate whether route switching has occurred or not for the Redundant CPU connected to MELSECNET/H, check the following items in the redundant setting of the network parameter dialog box of GX Developer.
- Issue a system switching request at disconnection detection.
- Issue a system switching request at communication error.

Check the following based on the statuses of the above special relay and special registers, and remove the error cause.
- Check the Redundant CPU for an error.
- Check the tracking cable status and whether the tracking cable is correctly connected.
- Check the relevant network module for an error and the network where the relevant network module is connected for an error.

2) Examples of access by route switching

The following shows examples of route switching during access to the control system.

<When system switching occurs at communication error>

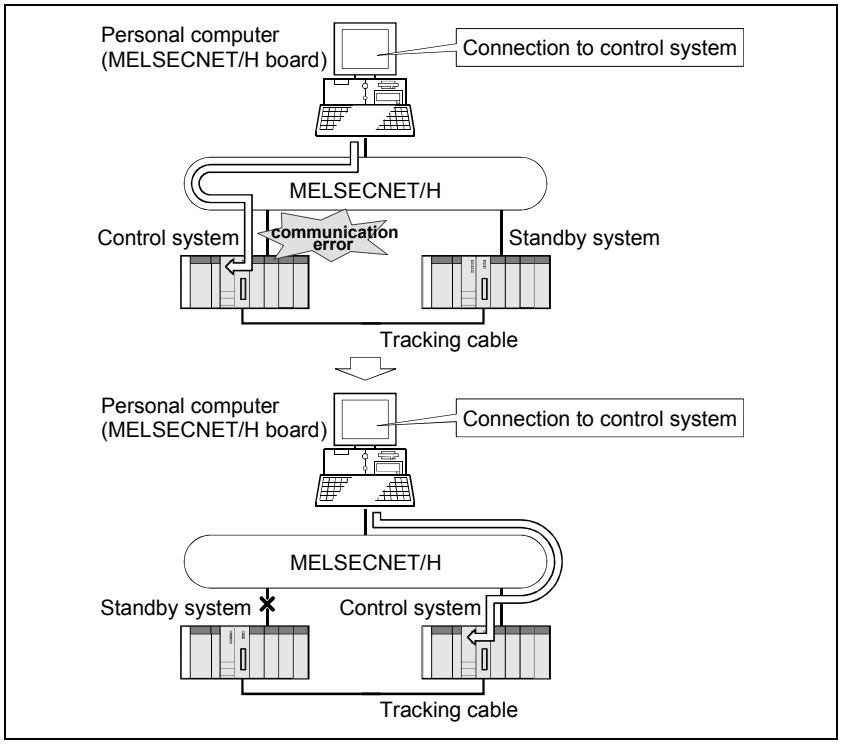


Fig. 1 Route switching example 1

<When standby system fault occurs>

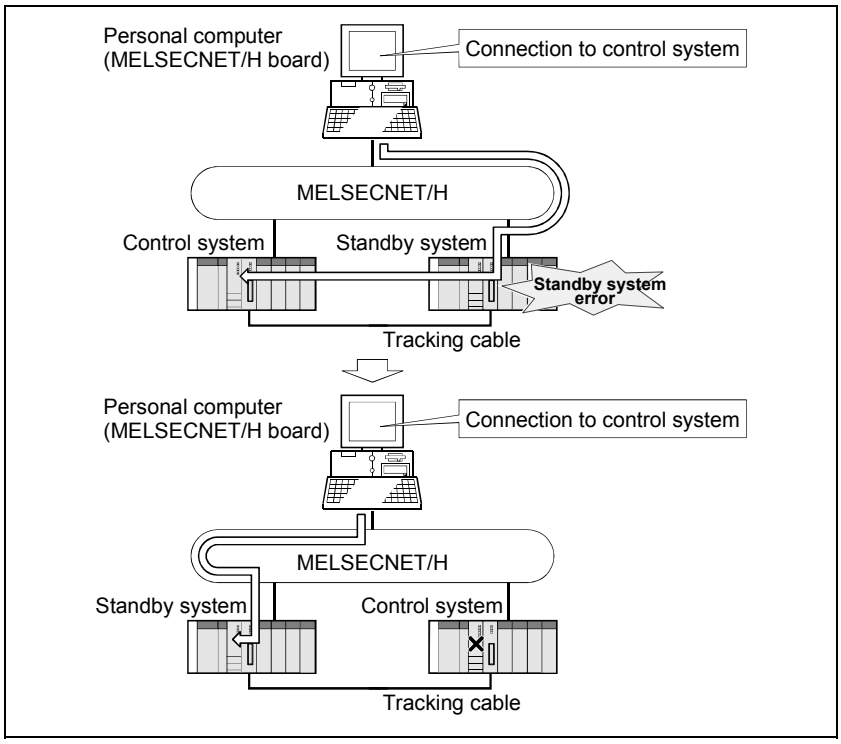


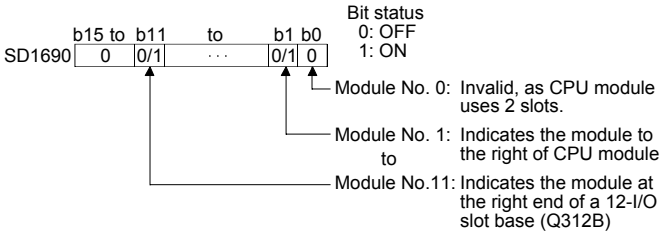
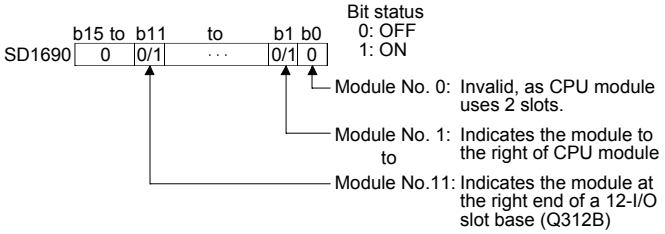
Fig. 2 Route switching example 2

POINT

- Route switching is not executed if a communication error has already occurred at a communication start*1 for the Redundant CPU specified for the Logical Sta. No. (A communication error occurs.)
  If a communication error has occurred, refer to (b) in (4) Automatic switching of communication route, and remove the communication disturbance.
  *1: First communication after execution of the mdOpen function in the MELSEC data link library (communication using the mdReceive, mdSend, mdControl, mdDevRst, mdDevSet, mdRandR, mdRandW or mdTypeRead function).
- If other station access (including the programmable controller CPU other than the Redundant CPU) is made to nine or more stations simultaneously, automatic switching of communication route may not be executed.

REMARK

The following indicates details of the special relay and special registers to be monitored when estimating whether route switching occurred or not.

Number	Name	Meaning	Explanation
SM1600	Other system error flag	OFF: No error ON: Error	• Turns on when an error occurs during redundant system error check. (Turns on when either of bits for SD1600.) • Remains off when no errors are present.
SD1590	Module No. for network module requesting route switching in host system	Module No. for network module requesting route switching in host system	• Any of the following bits turns on corresponding to module No. for network module requesting route switching in host system. • Turns off by the system after recovery from error of the relevant module by user.  • Refer to SD1690 for module No. for network module requesting route switching in other system.
SD1690	Module No. for network module requesting route switching in other system	Module No. for network module requesting route switching in other system	• Any of the following bits turns on corresponding to module No. for network module requesting route switching in other system. • Turns off by the system after recovery from error of the relevant module by user.  • Refer to SD1590 for module No. for network module requesting route switching in host system.

Appendix 2 Host Station Status at Power ON/OFF When Using Q80BD-J71LP21S-25

When using the Q80BD-J71LP21S-25, the host station status varies depending on the ON/OFF status of the external power supply and personal computer as shown below.

(1) When the system is started

No.	Status	External power supply	PC power	Host station status		
				Loop status ＊1	Communication status ＊2	Data link ＊3
1	External power supply OFF before ON	OFF	OFF	Loopback occurred	Abnormal (Disconnected)	Not executed
2	External power supply ON before PC startup (power-ON)	ON	OFF	Normal	Abnormal (Disconnected)	Not executed
3	PC startup (power-ON) before MELSECNET/H driver startup	ON	ON			
4	After MELSECNET/H driver startup	ON	ON	Normal	Normal communication	Executed

(2) When the personal computer is started

No.	Status	External power supply	PC power	Host station status		
				Loop status ＊1	Communication status ＊2	Data link ＊3
5 ＊4	PC power OFF before PC startup (power-ON)	ON	OFF	Normal	Normal communication	Not executed
6	PC power startup (power-ON or restart) before MELSECNET/H driver startup	ON	ON	Normal	Abnormal (Disconnected)	Not executed
7	After MELSECNET/H driver startup	ON	ON	Normal	Normal communication	Executed

(3) When the system is shut down

No.	Status	External power supply	PC power	Host station status		
				Loop status ＊1	Communication status ＊2	Data link ＊3
8	PC power OFF before external power supply OFF	ON	OFF	Normal	Normal communication	Not executed
9	External power supply OFF	OFF	OFF	Loopback occurred	Abnormal (Disconnected)	Not executed

＊1: The status can be checked on the network monitor screen of the MELSECNET/H utility, the Network diagnostics of GX Developer connected to other station's PLC or at areas SW91 to SW9A.

＊2: The status can be checked on each station status screen of the MELSECNET/H utility, the Network diagnostics of GX Developer connected to other station's PLC or at areas SW70 to SW73.

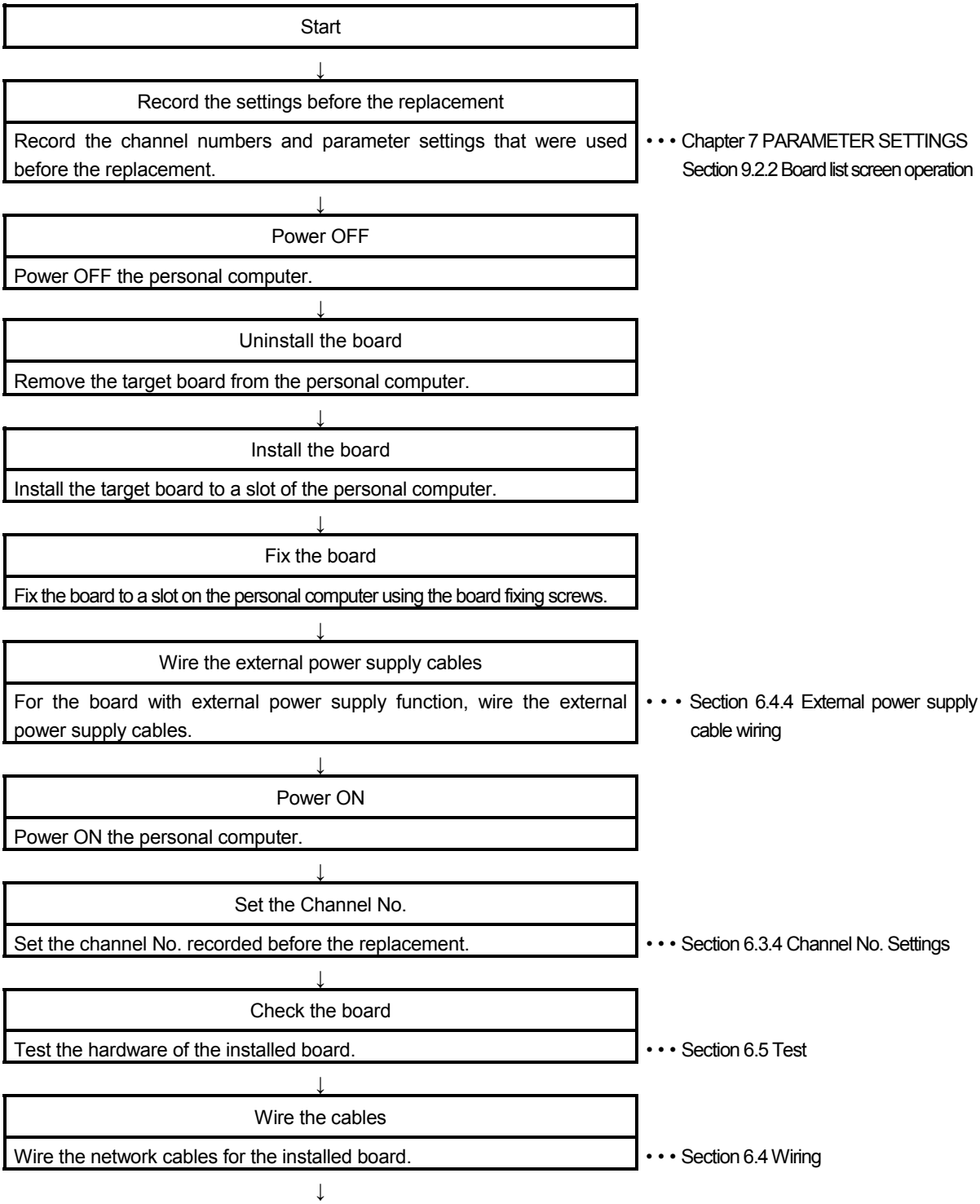
＊3: The status can be checked on the Network diagnostics of GX Developer connected to other station's PLC or at areas SW74 to SW77.

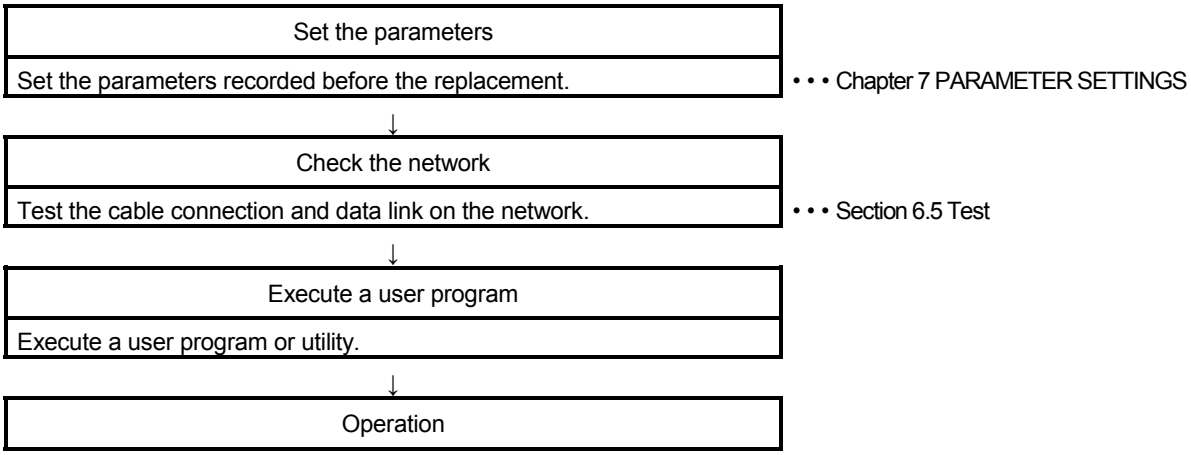
＊4: This status is irrelevant when rebooting the personal computer without turning off its power.

Appendix 3 Procedures for Replacing Boards

This section explains the procedure to replace a MELSECNET/H board.

(1) Replacement procedure


Start
Record the settings before the replacement
Record the channel numbers and parameter settings that were used before the replacement.
• • • Chapter 7 PARAMETER SETTINGS Section 9.2.2 Board list screen operation
Power OFF
Power OFF the personal computer.
Uninstall the board
Remove the target board from the personal computer.
Install the board
Install the target board to a slot of the personal computer.
Fix the board
Fix the board to a slot on the personal computer using the board fixing screws.
Wire the external power supply cables
For the board with external power supply function, wire the external power supply cables.
• • • Section 6.4.4 External power supply cable wiring
Power ON
Power ON the personal computer.
Set the Channel No.
Set the channel No. recorded before the replacement.
• • • Section 6.3.4 Channel No. Settings
Check the board
Test the hardware of the installed board.
• • • Section 6.5 Test
Wire the cables
Wire the network cables for the installed board.
• • • Section 6.4 Wiring


Set the parameters
Set the parameters recorded before the replacement.
• • • Chapter 7 PARAMETER SETTINGS
Check the network
Test the cable connection and data link on the network.
• • • Section 6.5 Test
Execute a user program
Execute a user program or utility.
Operation

(2) Precautions

When a MELSECNET/H board is replaced, channel numbers are automatically re-assigned. For details on the channel number to be assigned, refer to Section 6.3.4.

As parameter settings (Refer to Chapter 7) correspond to channel numbers, the replaced board works with the parameter settings shown below.

- When un-used channel numbers are newly assigned:
  Works with the default status.
- When channel numbers that were used are assigned:
  Works with the parameter settings corresponding to the channel numbers.

When replacing a MELSECNET/H board, check the parameter settings with the “Board information setting” screen.

Appendix 4 Combinations of Boards with Existing Software

There is no restriction when using MELSECNET/H board with other MELSEC interface boards or MELSOFT products on the same personal computer. For the restrictions of the applicable operating environment and applicable access target, refer to the manual of each product.

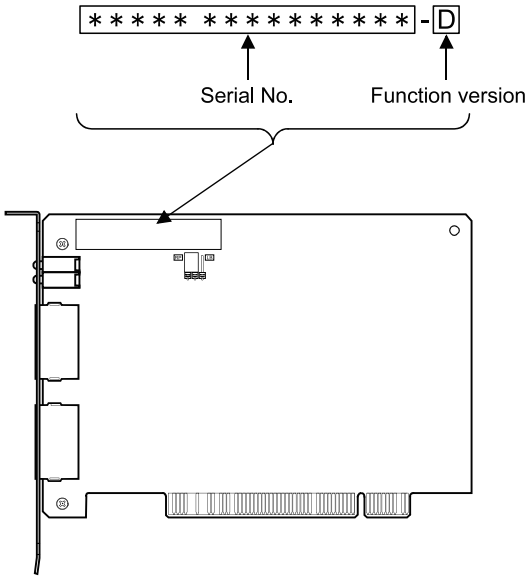
Appendix 5 Checking Serial Number and Function Version

This section explains how to check serial number, the function version and ROM version of the MELSECNET/H board and the SW0DNC-MNETH-B version.

(1) Checking serial number, function version, and ROM version of the MELSECNET/H board

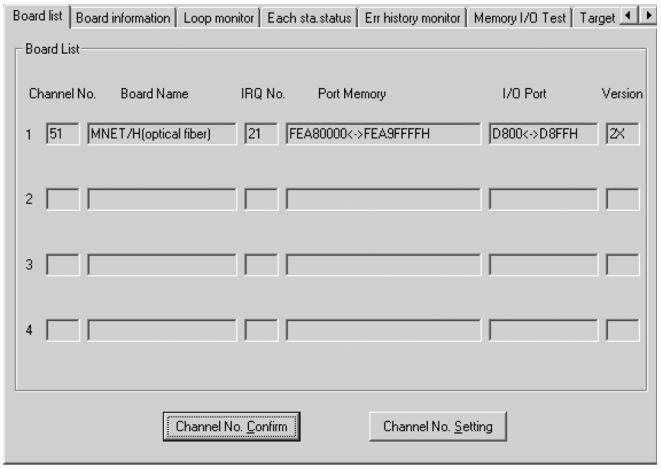
(a) Checking serial number and function version

The function version of the MELSECNET/H board can be checked at "Serial" section as shown below.



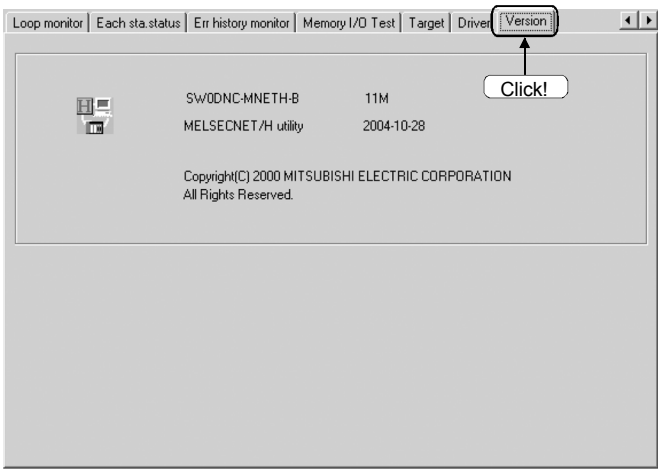
(b) Checking ROM version

The ROM version of the MELSECNET/H board is shown on "Board list" tab in the MNETH utility.



(2) Checking the SW0DNC-MNETH-B version

The SW0DNC-MNETH-B version is shown on "Version" tab in the MNETH utility.



Appendix 6 New and Improved Functions

Appendix 6.1 Change of hardware function

The following table shows the new and the improved functions in the MELSECNET/H board.

New and improved function	First five digits of the serial number	Software version of SW0DNC-MNETH-B
MELSECNET/H Extended mode	06112 or higher	11M or later

Appendix 6.2 Update of software package

For details of the update version software and the functions which are added or changed, please consult your local Mitsubishi representative.

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Appendix 7 Restrictions for Operating System

The following applicable operating system is not supported by SW1DNC-MNETH-B with the software version 26C or later. When using the following operating system, install SW1DNC-MNETH-B version 25B.

(1) Operating systems which are not supported by version 26C or later

The following operating systems are not supported.

- Windows ® 95
- Windows ® 98
- Windows ® NT
- Windows ® 2000

(2) Installation method for supported version

Install SW1DNC-MNETH-B with the software version 25B by double-clicking "Setup.exe" stored in the following folder on the CD-ROM of software package.

(CD-ROM drive):\Win9x_NT_2k

(3) Manual

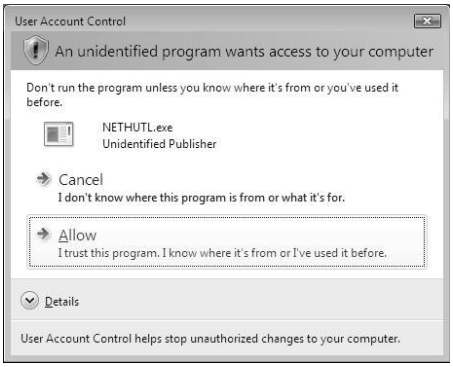
For the function and handling method for SW1DNC-MNETH-B with the software version 25B, refer to the manual (SH-080128ENG-Y) of the product. The manual is stored in the following folder on the CD-ROM of software package.

(CD-ROM drive):\Win9x_NT_2k\Manual

Appendix 8 Warning Message Appears on Windows®

Appendix 8.1 Overview of warning message

When an operating system with the user account control function is used, a warning message appears when you run the MELSECNET/H utility or the Device monitor utility. (Refer to Section 9.1)


User Account Control
An unidentified program wants access to your computer
Don't run the program unless you know where it's from or you've used it before.
NETHUTL.exe
Unidentified Publisher
Cancel
I don't know where this program is from or what it's for.
Allow
I trust this program. I know where it's from or I've used it before.
Details
User Account Control helps stop unauthorized changes to your computer.

User Account Control
Do you want to allow the following program from an unknown publisher to make changes to this computer?
Program name: NETHUTL.exe
Publisher: Unknown
File origin: Hard drive on this computer
Show details
Yes
No
Change when these notifications appear

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Appendix 8.2 Methods for preventing the warning message

POINT
The user account control (UAC) function prevents a crash (e.g. prevention of start-up of a program which executes unintended operation). Before setting this function, grasp that the security function offered by UAC will be disabled and fully understand the risk.

The following two methods are available for preventing a warning message.

(1) Disabling the user account control function

The following shows a procedure for disabling the user account control function.

(a) Using Windows Vista® /Windows Server ® 2008/ Windows Server ® 2008 R2

1) Open the Control Panel.

↓

2) Select [User Accounts].

↓

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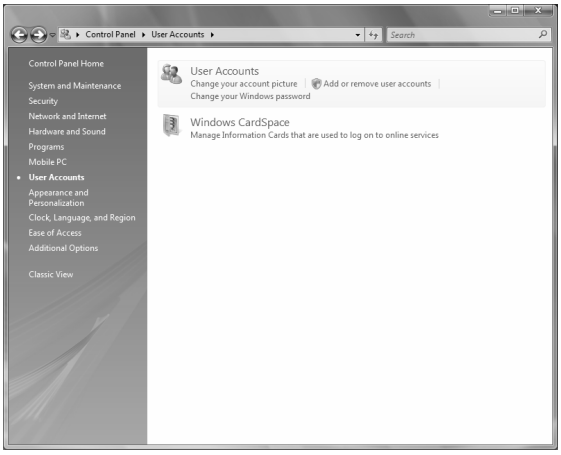
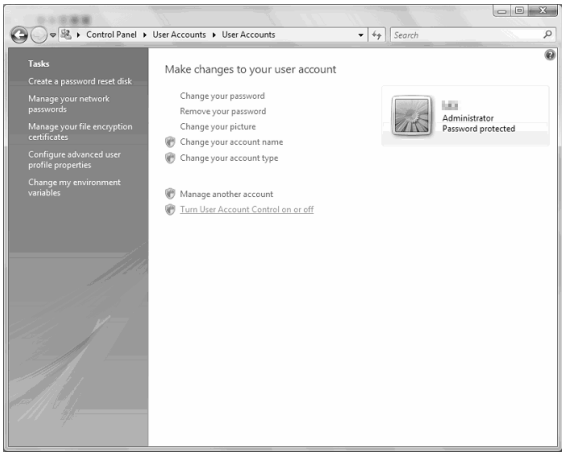
↓



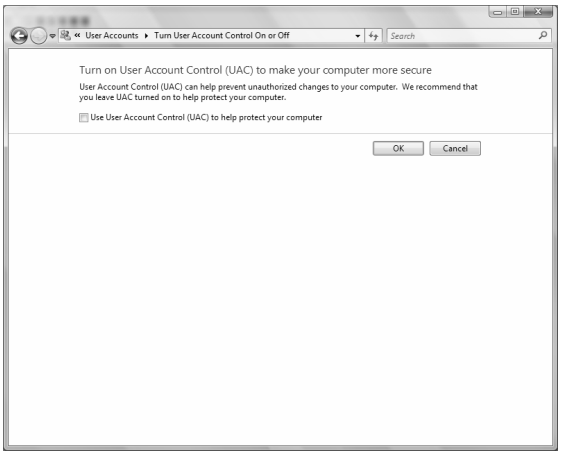
↓

3) Select [User Accounts].



↓

4) Select [Turn User Account Control on or off].


User Accounts ▸ Turn User Account Control On or Off ▸
Search
Turn on User Account Control (UAC) to make your computer more secure
User Account Control (UAC) can help prevent unauthorized changes to your computer. We recommend that you leave UAC turned on to help protect your computer.
Use User Account Control (UAC) to help protect your computer
OK
Cancel

↓

5) Deselect [Turn on User Account Control (UAC) to make your computer more secure] and click the OK button.

↓

(Setting completion)

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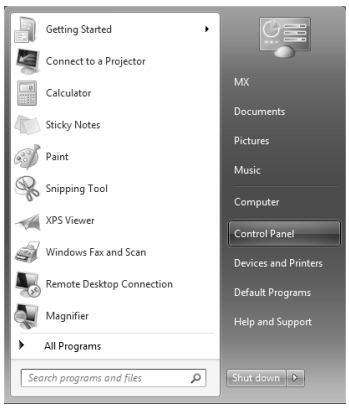
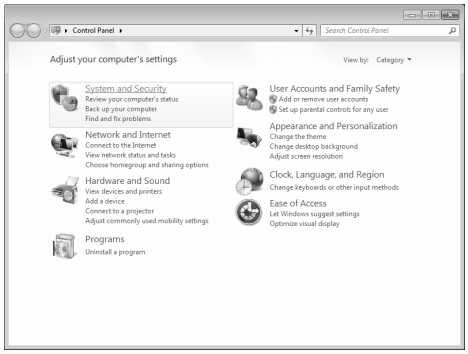
(b) Using Windows® 7/ Windows Server® 2012/ Windows® 8



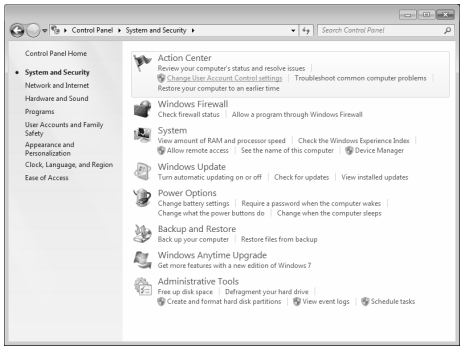
↓

1) Open the Control Panel.



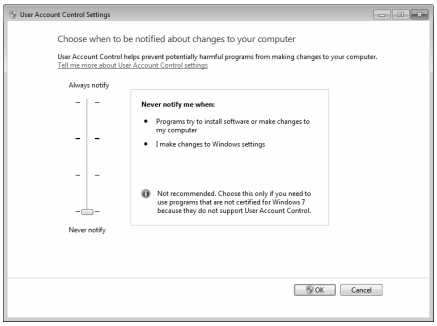
↓

2) Select [System and Security].



↓

3) Select [Change User Account Control settings].


User Account Control Settings
Choose when to be notified about changes to your computer
User Account Control helps prevent potentially harmful programs from making changes to your computer.
Tell me more about User Account Control settings
Always notify
Never notify me when:
Programs try to install software or make changes to my computer
I make changes to Windows settings
Not recommended. Choose this only if you need to use programs that are not certified for Windows 7 because they do not support User Account Control.
Never notify
OK
Cancel

↓

4) Set the slide bar "Never notify" and click the "OK" button.

↓

(Setting completion)

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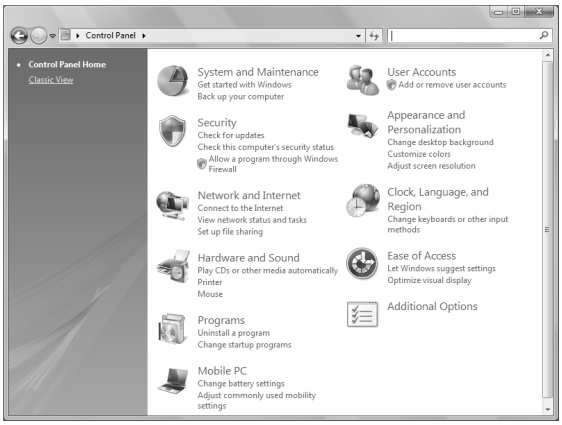
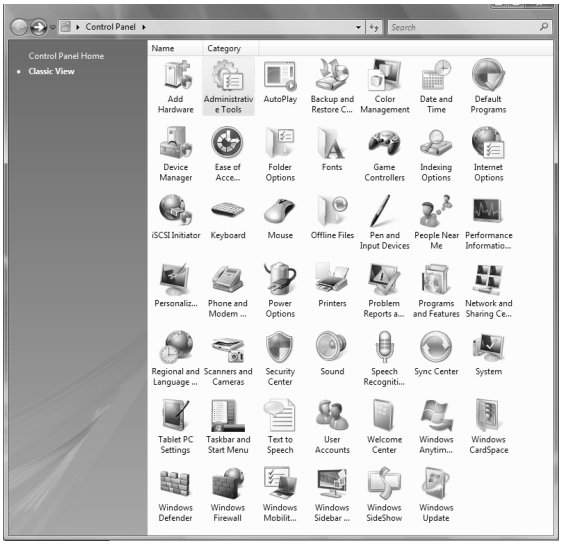
(2) Allowing the warning message without showing it

The following shows a procedure for allowing a warning message without showing it.

1) Open the Control Panel.



2) Select [System and Security] or [Classic View].



3) Select [Administrative Tools].

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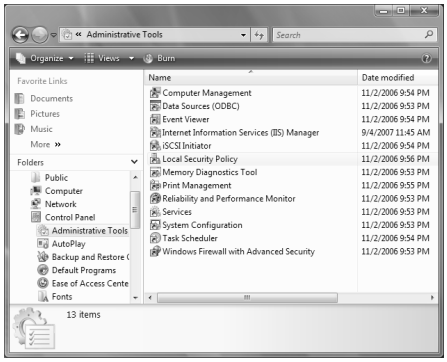

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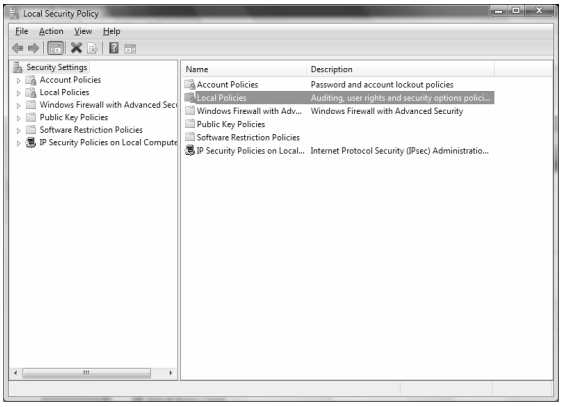
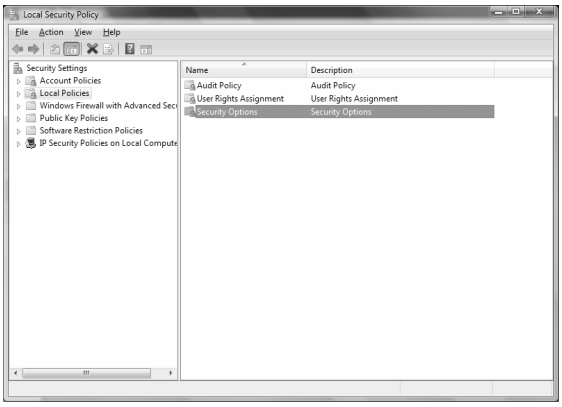


↓



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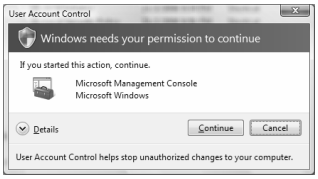
4) Select [Local Security Policy].

REMARKS

When user account control is enabled the following screen appears. Click the Continue or Yes button.



User Account Control
Do you want to allow the following program to make changes to this computer?
Program name: Microsoft Management Console
Verified publisher: Microsoft Windows
Show details
Yes
No
Change when these notifications appear

5) Select [Local Policies].

6) Select [Security Options].

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(From preceding page)

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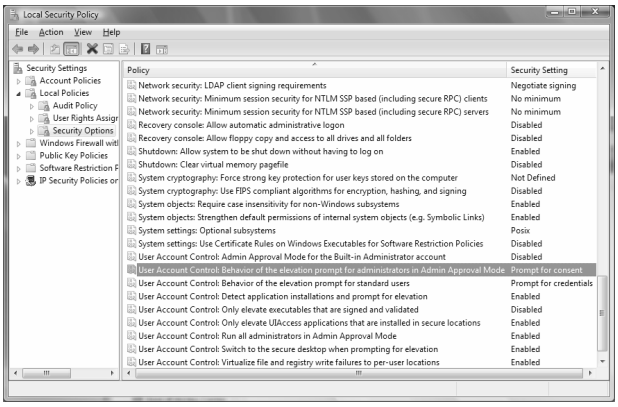
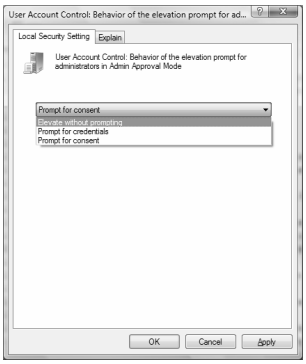

Local Security Policy
File Action View Help
Security Settings
Account Policies
Local Policies
Audit Policy
User Rights Assign
Security Options
Windows Firewall with
Public Key Policies
Software Restriction P
IP Security Policies on
Policy
Security Setting
Network security: LDAP client signing requirements
Negotiate signing
Network security: Minimum session security for NTLM SSP based (including secure RPC) clients
No minimum
Network security: Minimum session security for NTLM SSP based (including secure RPC) servers
No minimum
Recovery console: Allow automatic administrative logon
Disabled
Recovery console: Allow floppy copy and access to all drives and all folders
Disabled
Shutdown: Allow system to be shut down without having to log on
Enabled
Shutdown: Clear virtual memory pagefile
Disabled
System cryptography: Force strong key protection for user keys stored on the computer
Not Defined
System cryptography: Use FIPS compliant algorithms for encryption, hashing, and signing
Disabled
System objects: Require case insensitivity for non-Windows subsystems
Enabled
System objects: Strengthen default permissions of internal system objects (e.g. Symbolic Links)
Enabled
System settings: Optional subsystems
Posix
System settings: Use Certificate Rules on Windows Executables for Software Restriction Policies
Disabled
User Account Control: Admin Approval Mode for the Built-in Administrator account
Disabled
User Account Control: Behavior of the elevation prompt for administrators in Admin Approval Mode
Prompt for consent
User Account Control: Behavior of the elevation prompt for standard users
Prompt for credentials
User Account Control: Detect application installations and prompt for elevation
Enabled
User Account Control: Only elevate executables that are signed and validated
Disabled
User Account Control: Only elevate UIAccess applications that are installed in secure locations
Enabled
User Account Control: Run all administrators in Admin Approval Mode
Enabled
User Account Control: Switch to the secure desktop when prompting for elevation
Enabled
User Account Control: Virtualize file and registry write failures to per-user locations
Enabled

7) Select [User Account Control: Behavior of the elevation prompt for administrators in Admin Approval Mode Prompt for consent].

↓



8) Select [Elevate without prompting] on the <<Local Security Setting>> tab, and click the OK button.

↓

(Setting completion)

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Appendix 9 Behavior When Personal Computer Enters Power Save Mode or Fast Startup

MELSECNET/H board does not support the power save mode (standby, hibernate, sleep) and the fast startup function. The following explains the behavior of the personal computer when the personal computer enters each mode.

Appendix 9.1 Behavior when the personal computer enters the power save mode (standby, hibernate)

(1) Target operating system

The following operating systems have the power save mode (standby, hibernate)

- Windows ® XP
- Windows Server® 2003 R2

(2) Behavior when entering the standby mode/hibernation mode

When the personal computer enters the power save mode (standby, hibernate), the following message appears and the power save mode (standby, hibernate) is disabled.

The MELSECNET/H board continues its operation and the data link remains normal.

<When entering the standby mode>

System Standby Failed
The device driver for the 'PCI MELSECNET/H Controller' device is preventing the machine from entering standby. Please close all applications and try again. If the problem persists, you may need to update this driver.
OK

<When entering the hibernation mode>

System Hibernation Failed
The device driver for the 'PCI MELSECNET/H Controller' device is preventing the machine from entering hibernation. Please close all applications and try again. If the problem persists, you may need to update this driver.
OK

(3) Countermeasure

When the personal computer is set to enter the power save mode (standby, hibernate), check and change the setting for when the computer's power button is pressed, or the settings of the uninterruptible power supply system (UPS) on the control panel.

Appendix 9.2 Behavior when the personal computer enters the power save mode (hibernate, sleep)

(1) Target operating system

The following operating systems have the power save mode (hibernate, sleep)

- Windows ® Vista
- Windows Server® 2008
- Windows Server® 2008 R2
- Windows ® 7
- Windows Server® 2012
- Windows ® 8

(2) Behavior when entering the hibernation mode/sleep mode

The following explains the behavior of the board when the power save mode (hibernate, sleep) is entered on the personal computer.

- The MELSECNET/H board stops its operation and is disconnected from the network.
- The board is not reconnected even after the personal computer returns from the power save mode (hibernate, sleep).
- After the personal computer returns from the power save mode (hibernate, sleep), "-28141(9213H) : System sleep error" occurs when accessing MELSECNET/H board from the MELSECNET/H utility or an application program, which includes MELSEC data link library function.

(3) Countermeasure

When the personal computer is set to enter the power save mode (hibernate, sleep), the setting is changed by MELSECPowerManager.
For details of MELSECPowerManager, refer to Appendix 10.

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Appendix 9.3 Behavior when the fast startup function is enabled

(1) Target operating system

The following operating systems have the fast startup function.

- Windows Server® 2012
- Windows ® 8

(2) Behavior when the fast startup function is enabled

The following explains the behavior of the board when the fast startup function is enabled.

- The board is not reconnected even after the fast startup.
- After the fast startup, "-28141(9213H) : System sleep error" occurs when accessing MELSECNET/H board from the MELSECNET/H utility or an application program, which includes MELSEC data link library function.

(3) Countermeasure

When the fast startup function is enabled, the setting is changed to disabled by MELSECPowerManager.

For details of MELSECPowerManager, refer to Appendix 10.

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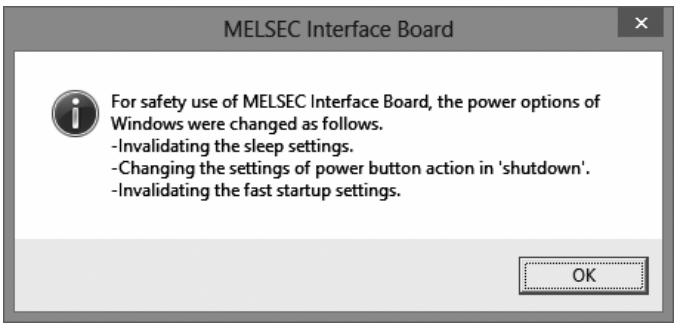
Appendix 10 MELSECPowerManager

MELSECPowerManager is a service application which monitors the Windows® Power Options settings every 30 seconds to prevent the personal computer from entering the power save mode (hibernate, sleep).
MELSECPowerManager is applicable for the following operating systems.

- Windows ® Vista
- Windows Server® 2008
- Windows Server® 2008 R2
- Windows ® 7
- Windows Server® 2012
- Windows ® 8

When a personal computer is set to enter the power save mode (hibernate, sleep) or the fast startup function is enabled, the following message is displayed and the setting is changed by MELSECPowerManager.


MELSEC Interface Board
For safety use of MELSEC Interface Board, the power options of Windows were changed as follows.
-Invalidating the sleep settings.
-Changing the settings of power button action in 'shutdown'.
-Invalidating the fast startup settings.
OK

Appendix 10.1 Installing MELSECPowerManager

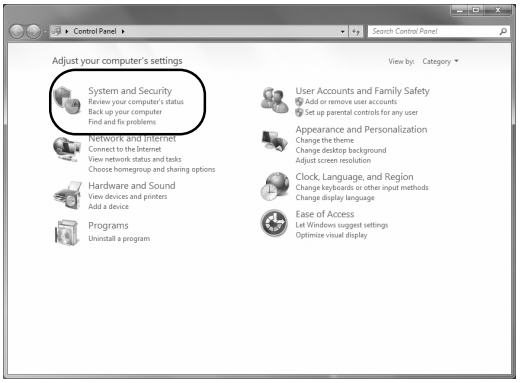
MELSECPowerManager is installed automatically when the software package is installed to a personal computer
The operation starts after the personal computer is restarted.

Appendix 10.2 Uninstalling MELSECPowerManager

MELSECPowerManager is uninstalled automatically when the software package is uninstalled.
However, it is not uninstalled when another software package of MELSEC interface board is installed to the personal computer.
Uninstall all software packages for MELSEC interface board installed on the personal computer to uninstall MELSECPowerManager.

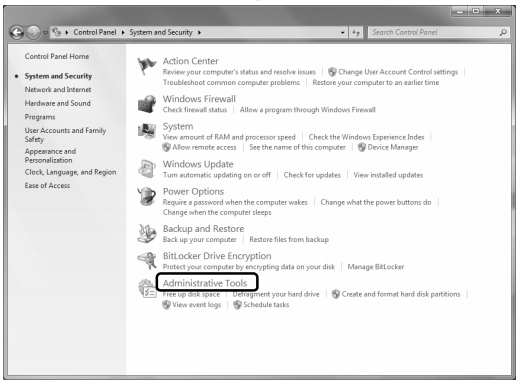
Appendix 10.3 Checking MELSECPowerManager

The following explains how to check the installation and operating status of MELSECPowerManager.
The following is a setting example when using Windows® 7.



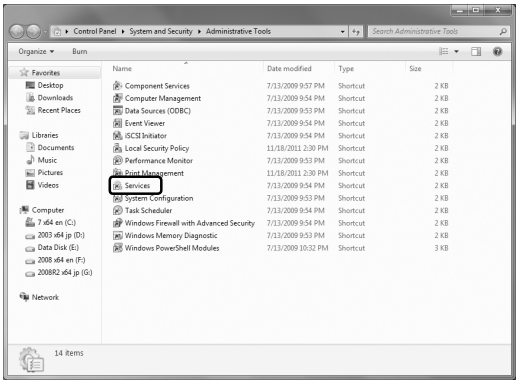
↓

1) Open the Control Panel and select [System and Security].



↓

2) Select [Administrative Tools].



↓

3) Double-click [Services].

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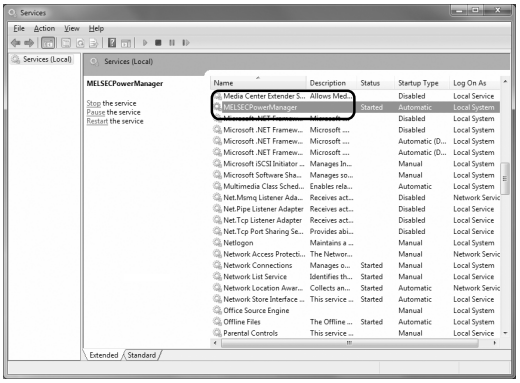


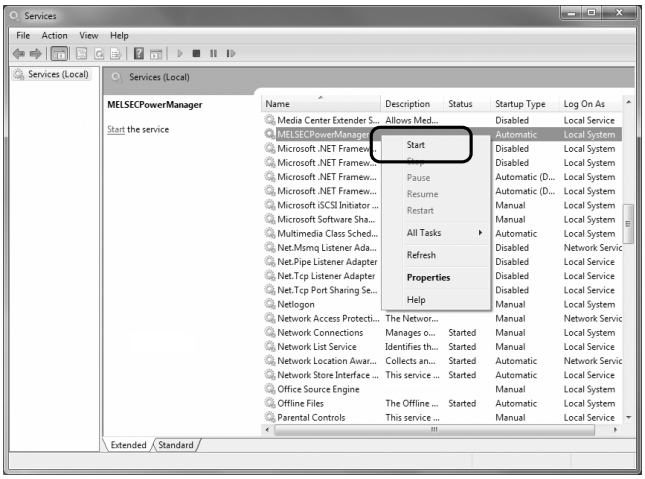
↓

(Setting completion)

4) Check if MELSECPowerManager is registered.

POINT

- When MELSECPowerManager is disabled, the personal computer may enter the power save mode (hibernate, sleep) automatically depending on the settings on the personal computer. Do not disable MELSECPowerManager because the MELSECNET/H board does not function normally if the personal computer enters the power save mode (hibernate, sleep). For the behavior of the board when the personal computer enters the power save mode (hibernate, sleep), or the fast startup function is enabled, refer to Appendix 9.
- If MELSECPowerManager is disabled accidentally, right-click "MELSECPowerManager" on the "Services (Local)" screen and select "Start" from the menu.



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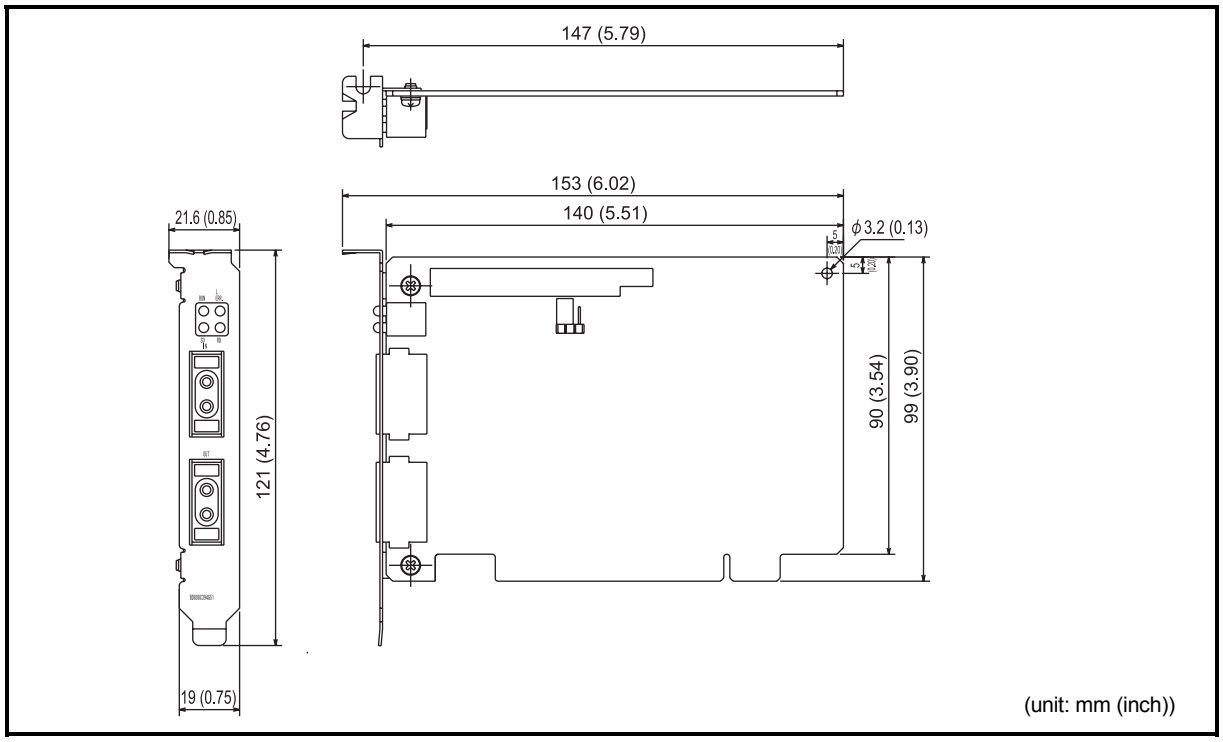
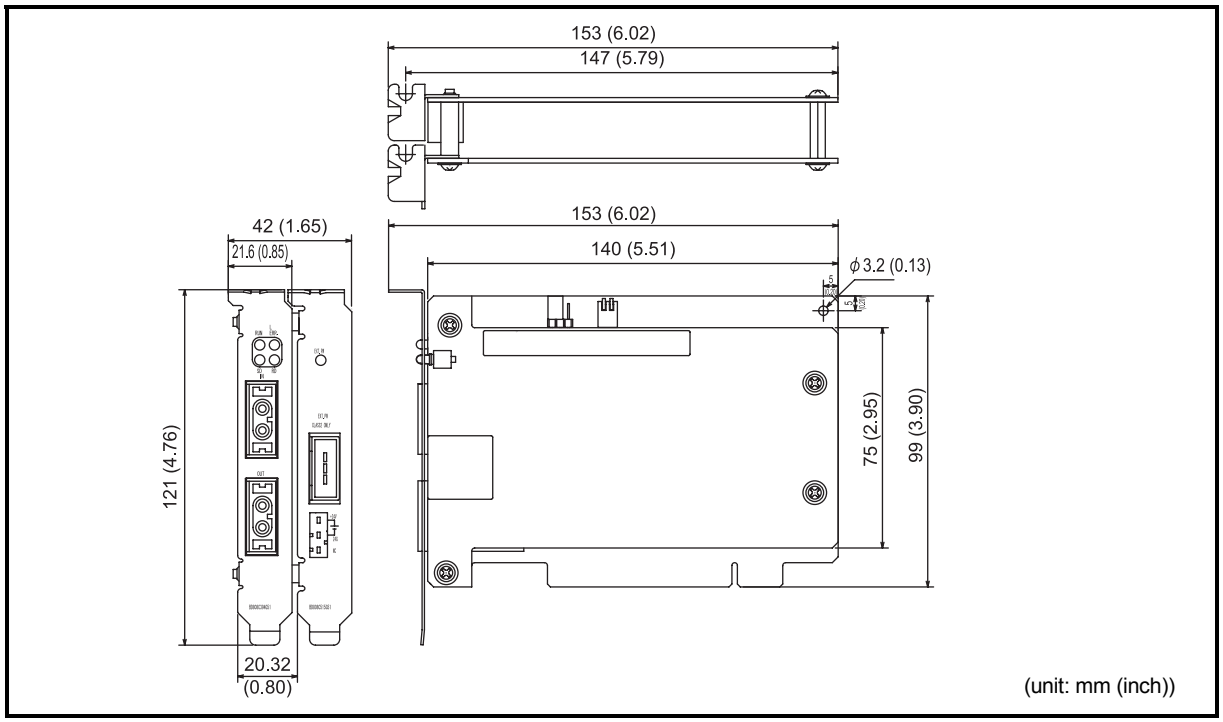
Appendix 11 External Dimensions

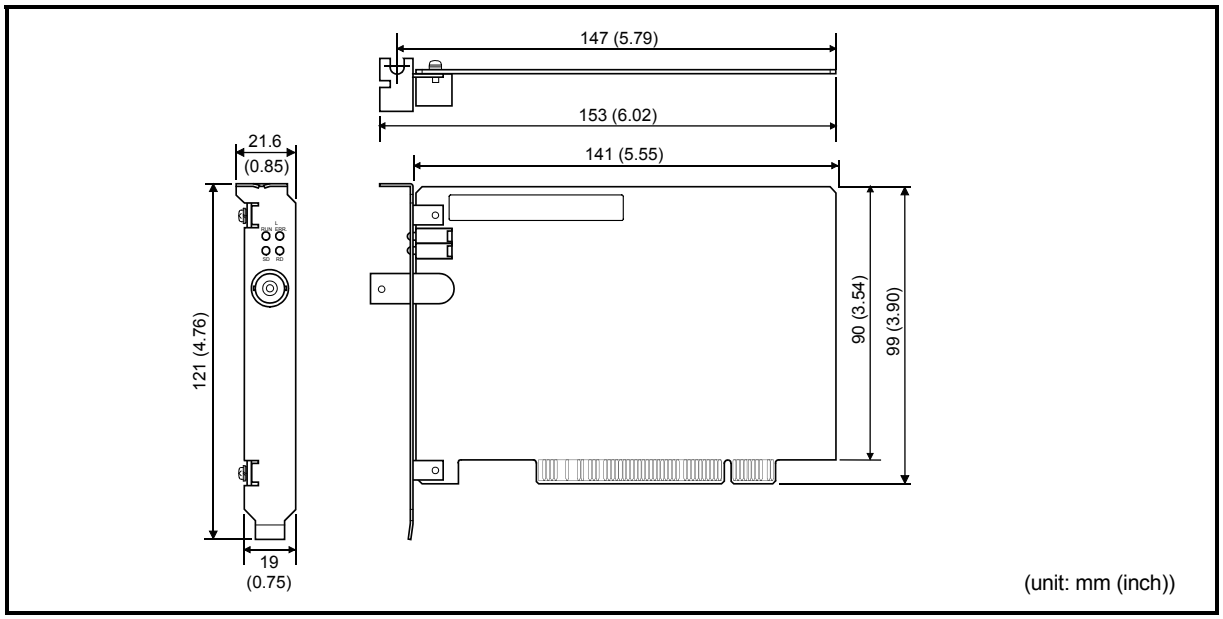
Appendix 11.1 Q80BD-J71LP21-25, Q80BD-J71LP21G, Q80BD-J71LP21GE



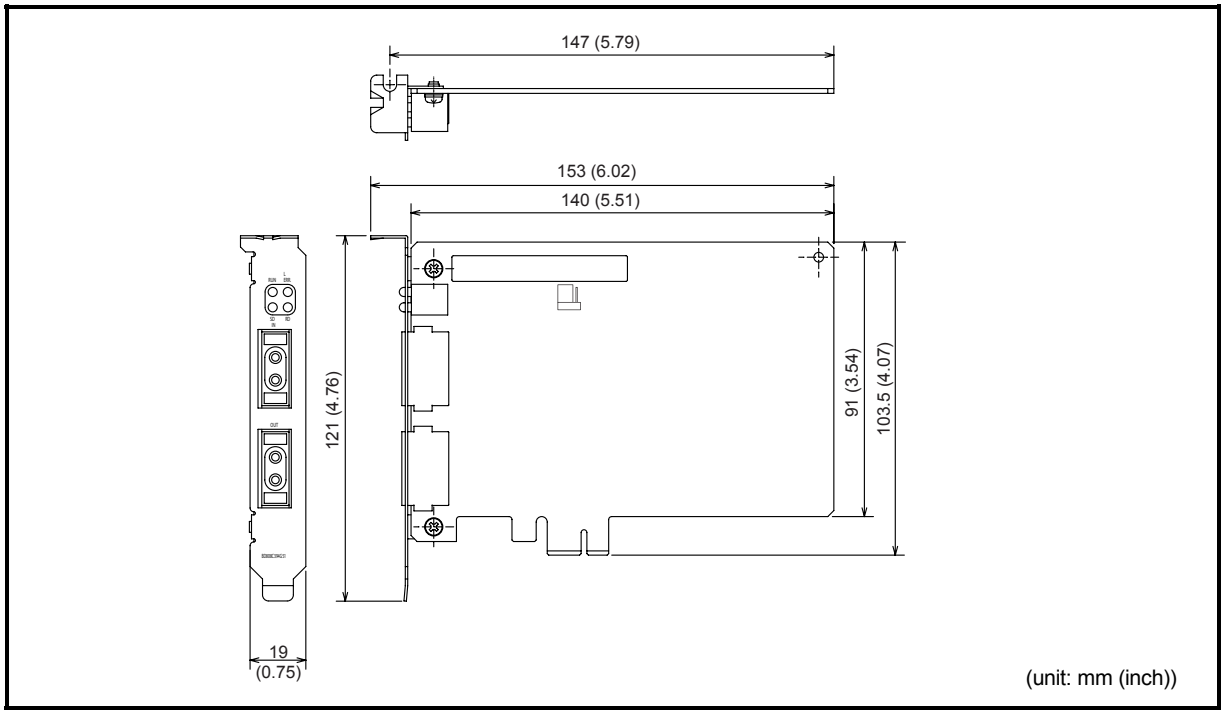
Appendix 11.2 Q80BD-J71LP21S-25



Appendix 11.3 Q80BD-J71BR11



Appendix 11.4 Q81BD-J71LP21-25



WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.
However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for three years after the date of purchase or delivery to a designated place.
Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be (42) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

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MELSECNET/H Interface Board
User's Manual (For SW0DNC-MNETH-B)

MODEL	SW0-MNETH-B-U-E
MODEL CODE	13JR24
SH(NA)-080128-Z(1309)KWIX	

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE : TOKYO BUILDING, 2-7-3 , CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS : 1-14 , YADA-MINAMI 5-CHOME , HIGASHI-KU, NAGOYA , JAPAN

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Specifications subject to change without notice.